

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

		1. CONTRACT ID CODE		PAGE OF PAGES 1 2	
2. AMENDMENT/MODIFICATION NO. 001		3. EFFECTIVE DATE August 25, 2006		4. REQUISITION/PURCHASE REQ. NO.	
		5. PROJECT NO. (If applicable)			
6. ISSUED BY ARCHITECT OF THE CAPITOL United States Capitol Washington, D.C. 20515			7. ADDRESS AMENDMENT/MODIFICATION TO Architect of the Capitol, Procurement Division Ford House Office Building, Attn: John Friedhoff Second and "D" Streets, S.W., Room H2-263 Washington, DC 20515		
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)			(X)	9A. AMENDMENT OF SOLICITATION NO. RFP No. 060094	
				9B. DATED (See Item 11) August 3, 2006	
					10A. MODIFICATION OF CONTRACT/ORDER NO.
CODE		FACILITY CODE		10B. DATED (See Item 13)	
SUBJECT: IDIQ For Repair, Renovation, Alteration to Facilities for AOC Job Order Contract					

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of offers X is extended. **THE DUE DATE FOR PROPOSALS IS September 28, 2006 AT 2:00 PM local time.**

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

(a) By completing Items 8 and 15, and return 1 copies of the amendment*; (b) By acknowledging receipt of this amendment in Block 12 of Page 1 of the solicitation package, giving amendment number and its date; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. **FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER.** If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter make reference to the solicitation and this amendment, and is received prior to the opening/receipt hour and date specified. (*Note: Please only return 3 copies this amend. Pages 1-2 & NO ATTACHMENTS.)

12. ACCOUNTING AND APPROPRIATION DATA (If required)

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT/ORDER NO. IN ITEM 10A.			
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).			
C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:			
D. OTHER (Specify type of modification and authority)			
E. IMPORTANT: Contractor _____ is not, _____ is required to sign this document and return it to the issuing office.			
14. DESCRIPTION OF AMENDMENT/MODIFICATION 1. SEE CONTINUATION PAGES. Except as provided herein, all terms and conditions of the document referenced in Item 9A, as heretofore changed, remains unchanged and in full force and effect.			
15A. NAME AND TITLE OF SIGNER (Type or print)		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)	
15B. CONTRACTOR/OFFEROR _____ (Signature of person authorized to sign)	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA By _____ (Signature of Contracting Officer)	16C. DATE SIGNED

AMENDMENT NO.: 001
Solicitation No. RFP060094

This amendment is issued as follows

Remove Page(s)	Insert Pages
Table of Contents, Pages 1-2 Solicitation, Offer, and Award, Page 1	Table of Contents, Pages 1-2/Amendment 01 Solicitation, Offer, and Award Page 1, Amendment 01

_____A. This Amendment permits the contractor to obtain a single quote between \$2,500 and \$5,000. For requirements that fall within this price range competition is NOT required. In this price range a minimum of at least 3 independent, qualified and complete bids from potential subcontractors are NOT required. A rationale for selection of a subcontractor, and a brief statement on why the price is reasonable according to FAR 13.106-3 is required.

B. This Amendment No. 001 includes the A/E Design Manual dated October 2005, and the AOC Design Standards dated October 1, 2002 and Revised June 2004, and Section 13591 Special Procedures for Historic Treatment into solicitation RFP060094. These added documents are reflected in the Table of Contents new inserted pages indicated above. **Also the due date for proposal is extended to September 28, 2006 at 2:00 PM local time.** All other terms and conditions remain the same.

Attachments:

A/E Design Manual (174 pages)
AOC Design Standards (164 pages)
Section 013591 Special Procedures for Historic Treatment (7 pages)

Distribution:

Contract File
COTR -

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INDEFINITE QUANTITY/INDEFINITE DELIVERY CONTRACT FOR REPAIR, RENOVATION, ALTERATION TO FACILITIES FOR ARCHITECT OF THE CAPITOL JOB ORDER CONTRACT

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SOLICITATION, OFFER, AND AWARD <i>(Construction, Alteration, or Repair)</i> January 2004	1. SOLICITATION NO.	2. TYPE OF SOLICITATION	3. DATE ISSUED	PAGE OF PAGES	
	RFP NO. 060094	----- SEALED BID (IFB) <u>XX</u> NEGOTIATED (RFP)	3 AUG 06	1	2

IMPORTANT - The "offer" section on page 2 of 2 must be fully completed by offeror.

4. CONTRACT NO.		5. REQUISITION NO.		6. PROJECT NO.	
7. ISSUED BY ARCHITECT OF THE CAPITOL United States Capitol Washington, D.C. 20515			8. ADDRESS OFFER TO (NOTE - All handcarried bids will be rejected) Architect of the Capitol Procurement Division Ford House Office Building Attn: John Friedhoff Room H2-263 Bid Room Second and "D" Streets, S.W. Washington, DC 20515		
9. FOR INFORMATION CALL:		A. NAME		B. TELEPHONE NO. (Include area code) (NO COLLECT CALLS)	
		John Friedhoff		(202) 226-4525	

SOLICITATION

NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".

SUBJECT: **Job Order Contract for Architect of the Capitol.**

10. THE GOVERNMENT REQUIRES PERFORMANCE OF THE WORK DESCRIBED IN THESE DOCUMENTS (Title, identifying no., date):

11. The CONTRACTOR shall complete performance within **SEE CLAUSE AOC 52.211-5, SUPPLEMENTARY CONDITIONS** after Notice of Award.

12. The CONTRACTOR must furnish any required performance, payment bonds and insurance: XX YES ___ NO. If YES, within 15 calendar days after award.

13. ADDITIONAL SOLICITATION REQUIREMENTS:

A. Sealed offers in original and 4 copies to perform the work required are due at the place specified in Item 8 by **2:00 p.m.** local time **Sept. 28, 2006**. If this is a sealed bid solicitation, offers must be publicly opened at that time. Sealed envelopes containing offers shall be marked to show the offeror's name and address, the solicitation number, and the date and time offers are due.

B. An offer guarantee XX is, ___ is not required.

C. All offers are subject to the (1) work requirements, and (2) other provisions and clauses incorporated in the solicitation in full text or by reference.

D. Offers providing less than 90 Calendar days for Government acceptance after the date offers are due will not be considered and will be rejected.

RFP060094 Amendment 01

OFFER (Must be fully completed by offeror)

14. NAME AND ADDRESS OF OFFEROR (Include ZIP Code)

DUNS NO. _____ TIN _____

15. TELEPHONE & FACSIMILE NOS. (Include area codes)

16. REMITTANCE ADDRESS (Include only if different than Item 14)

17. The offeror agrees to perform the work required at the prices specified in the Schedule in strict accordance with the terms of this solicitation, if this offer is accepted by the Government in writing within 60 calendar days after the date offers are due.

18. The Offeror agrees to furnish any required performance, payment bonds and insurance.

19. ACKNOWLEDGMENT OF AMENDMENTS

(The offeror acknowledges receipt of amendments to the solicitation - give number and date of each)

AMENDMENT NO.										
DATE										
20A. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER (Type or print)	20B. SIGNATURE						20C. OFFER DATE			

AWARD (To be completed by Government)

21. ITEMS ACCEPTED:

22. AMOUNT

23. ACCOUNTING AND APPROPRIATION

24. SUBMIT INVOICES TO ADDRESS SHOWN IN ITEM 27

(In Triplicate)

25. AUTHORITY FOR NEGOTIATION, IF APPLICABLE

26. ADMINISTERED BY:

CODE _____

See Block 8

27. PAYMENT WILL BE MADE BY:

ARCHITECT OF THE CAPITOL
Ford House Office Building
Accounting Office, Room H2-205
Washington, D.C. 20024

CONTRACTING OFFICER WILL COMPLETE ITEM 28 OR 29 AS APPLICABLE

____ 28. NEGOTIATED AGREEMENT (Contractor is required to sign this document and return _____ copies to issuing office.) Contractor agrees to furnish and deliver all items or perform all work, requisitions identified on this form and any continuation sheets for the consideration stated in the contract. The rights and obligations of the parties to this contract shall be governed by (a) this contract award, (b) the solicitation, and (c) the clauses, requirements, certifications, and specifications or incorporated by reference in or attached to this contract.

____ 29. AWARD (Contractor is not required to sign this document.) Your offer on this solicitation, is hereby accepted as to the items listed. This award consummates the contract, which consists of (a) the government solicitation and your offer, and (b) this contract award. No further contractual document is necessary.

30A. NAME AND TITLE OF CONTRACTOR OR PERSON AUTHORIZED TO SIGN
(Type or print)

31A. NAME OF CONTRACTING OFFICER (Type or print)

30B. SIGNATURE

30C. DATE

31B. UNITED STATES OF AMERICA

31C. AWARD DATE

BY:



A/E DESIGN MANUAL

Architect of the Capitol Requirements for: Associate Architects/Engineers Design Contracts

October, 2005

Alan M. Hantman, FAIA
Architect of the Capitol
United States Capitol
Washington, D.C. - 20515

Documents contained in this Guide:

Introduction to the A/E Design Manual
Project Programing
Associate Architects/Engineers
Design Requirements for Small Projects
Design Requirements for Medium Projects
Design Requirements for Large Projects
Design Requirements for Large Projects w/CM
Construction Documents - The Drawings
Construction Documents - The Project Manual
Construction Documents - CAD Requirements
Construction Documents - Cost Estimates

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PART 1 - INTRODUCTION TO THE A/E DESIGN MANUAL

-
- 1.1 PURPOSE**
 - 1.2 DESIGN PHILOSOPHY**
 - 1.3 SCOPE**
 - 1.4 DEFINITIONS AND ABBREVIATIONS**
 - 1.5 CORRESPONDENCE**
 - 1.6 MEETINGS**
 - 1.7 ARCHITECT OF THE CAPITOL PERSONNEL**
 - 1.8 CORRECTIONS**
 - 1.9 DESIGN MANUAL CONVENTIONS:**

“We will be an innovative and efficient team dedicated to service excellence and to preserving, maintaining and enhancing the National treasures entrusted to our care.”

PART 1 - INTRODUCTION TO THE A/E DESIGN MANUAL

- 1.1 **PURPOSE:** The purpose of this manual is to describe and define the process and to enumerate the deliverables required from Associate Architects/Engineers for the design and construction of building projects for the Office of the Architect of the Capitol (AOC). Other manuals within the agency deal with definitions and processes for Work Orders, Service Calls, Initiatives, and other processes required for maintenance and operation of Congressional facilities.
- 1.2 **DESIGN PHILOSOPHY:**
- A. **Stewardship:** The Office of the Architect of the Capitol has identified stewardship as one of the agency’s core values. All of the agency’s design and maintenance efforts are undertaken with the protection and preservation of the Capitol Complex’s historic trust. The facilities are designed and constructed for very long design lives, using high quality durable materials that return their higher first cost through reduced replacement needs. Further, because the AOC maintains our own facilities, we are vitally concerned with the serviceability of materials and equipment of our facilities and will consider our value engineering options accordingly.
 - B. **Interagency Consistency:** To the extent possible, the AOC has attempted to align our requirements for deliverables with those of the U.S. General Services Administration and to incorporate appropriate language for same from *Facilities Standards for the Public Buildings Services*, PBS-P100.
- 1.3 **SCOPE:**
- A. **General:** This manual is applicable to all sizes and scopes of construction and renovation projects prepared by the Office of the Architect of the Capitol. The Professional Services Contract or the project Task Order will define both the project size and the required building quality level.
 - 1. **Project Size:** The AOC classifies projects as Small, Medium, Large, and Large Utilizing Construction Managers, and this manual provides differing processes for delivering each size of project. See Part 2 for definitions of Project Size and Part 4 for delivery processes.
 - 2. **Building Quality Levels:** AOC buildings are classified as Principal, Support, or Service class structures. Consult the AOC Design Standards for applicable design requirements.
 - B. **Applicability:** This Manual is not intended to be all-inclusive nor deal with all aspects of all projects. It will be supplemented from time-to-time as required.

- C. **Reference:** The procedures set forth in this Manual and its Appendices shall NOT be made a part of any Construction Document by reference.
- D. **Use:** The requirements of this Manual shall be considered mandatory unless specifically stated otherwise by the AOC.

1.4 DEFINITIONS AND ABBREVIATIONS:

- A. **Agency or AOC:** The Office of the Architect of the Capitol.
- B. **AOC Construction Manager:** The individual assigned by the AOC (as appropriate to whose forces are executing the project construction) to manage the construction of a given project. Normally this individual will be assigned during the Project Initiation Phase to enable participation in constructability reviews throughout the project's design and document production phases.
- C. **Associate Architect/Engineer:** A consultant engaged in private practice retained to execute a Project for the AOC. The Associate A/E is advised to carefully examine the AOC Professional Services Contract as the consulting responsibilities under AOC contracts differ materially from those executed with Executive Branch agencies. The Associate A/E may be required for specific projects to retain the services of consulting design specialists for certain areas of the work.
- D. **Building Program:** The summary of the Client's needs analysis and operational requirements for the project that clearly defines what is to be done, how it will be done, by whom, to whom, with what resources, and the results anticipated.
- E. **Capitol Complex:** The buildings and grounds of the Legislative Branch of the United States and the United States Supreme Court located within the District of Columbia in areas closely proximate to the United States Capitol that are under the jurisdiction of the Architect of the Capitol. The Legislative Branch also possesses properties located off of the Capitol Complex that are subject to requirements of the A/E Design Manual but may also be affected by local or state provisions that differ from the Capitol Complex itself:
 - 1. ***The United States Botanic Garden Nursery at D.C Village:*** Botanic Garden facilities and related facilities of the Architect of the Capitol and the United States Capitol Police.
 - 2. ***AOC Facilities at Ft. Meade, Maryland:*** Book storage facilities of the Library of Congress and warehousing of the Architect of the Capitol.
- F. **Client:** The using office or agency for whom the project is being designed and constructed. The "end user." (In this manual, the Architect of the Capitol is usually not considered the "client").
- G. **Construction Manager:** An independent firm retained by the Government to coordinate and manage all of the construction trades for a given project. Services may also include design oversight and the provision of constructability reviews as defined for a given project.

- H. **Contracting Officer's Technical Representative (COTR):** When a project involves an Associate Architect/Engineer, the Project Manager serves as the project Contracting Officer's Technical Representative COTR.
- I. **Facility Program:** An on-going, inter-related series of Projects undertaken over a defined period of time to accomplish a complex- or jurisdiction-wide scope of work.
- J. **Government:** The Legislative or Judicial Branches of the United States of America, as represented by the Office of the Architect of the Capitol.
- K. **Initial Project Statement:** A request for design or construction work prepared by the Superintendent's Project Coordinator or other project requesting official of the AOC based on interviews with the requesting entity.
- L. **Jobs:** A grouping of related work orders generated within the AOC's CAFM (computer-aided facility management) system that may or may not be performed as a result of a design project. Jobs are assigned tracking numbers (WOLIs - work order link identifiers) within the CAFM system. Jobs serve to ensure that related work orders are accomplished in an organized manner.
- K. **Program Director:** The Assistant Architect, a Superintendent, a Facility Manager, the Director of Architecture, the Director of Engineering, the Landscape Architect, or a Member of the AOC [Senior Policy Committee](#), or a designee of any of the preceding, who has authority for scope and budget control for a given AOC facility program. This individual is typically responsible for a number of projects and works with the Assistant Architect to establish individual project priority within the total project load of the agency. It is the responsibility of the Program Director to ensure that each project and Project Manager has the necessary resources to complete projects on time and within budget.
- L. **Project Statement:** The Project Statement is composed of three parts: The Program Description, the Project Justification, and the Project Schedule.
- M. **Project:** A project is any construction or interior design related task that requires the involvement of staff beyond the resources under the authority of a Superintendent or Facility Manager within the Office of the Architect of the Capitol. In practical terms, this usually implies a task that will require some kind of documented design, be it architectural, engineering, interior, or landscaping.
- N. **Project Manager:** The lead AOC design professional for a given project. Depending on project scope, the lead designer may be an architect, engineer, interior designer or Superintendent's Project Manager. The Project Manager is responsible for coordinating the design input and production, and for coordinating the design of all supporting Architects/Engineers assigned to a given project. The Project Manager shall notify Program Directors of progress in meeting required scopes, budgets, and time constraints. The AOC Project Manager is involved with the project from "cradle-to-grave." *[Other agencies call this position "Architect in Charge" or "Engineer in Charge"]*

- O. **Superintendent's Project Coordinator:** An individual on the staff of one of the AOC's Superintendent's Offices who is tasked with coordinating project requirements between the Client Organization and the AOC. This individual will prepare the initial Project Statement and Project budget estimate and will obtain initial approval of the appropriate authorizing Committee prior to commencement of any formal design services.
- P. **Task Leader:** An AOC design professional assigned to a specific project who provides supporting architectural or engineering design or design review coordinated by the Project Manager. A given project may have none or several Task Leaders assigned based on project complexity. The assignment of supporting architects/engineers is made by the Discipline Division Head for which that individual is employed and usually in consultation with the Program Director.

1.5 **CORRESPONDENCE:**

- A. **Project Correspondence:** Project correspondence shall be directed to the AOC Project Manager, c/o the Architect of the Capitol, U.S. Capitol, Washington, D.C. 20515.
 - 1. All correspondence shall contain the Project Title and the AOC Project Number.
 - 2. Reports of all conferences and telephone instructions shall be prepared and provided to the Project Director and the Project Architect/Engineer within five working days of the event.
 - 3. Correspondence regarding invoices shall be directed to Accounting Division, Architect of the Capitol, Washington, D.C. 20515.
- B. **Security of Mail:** Due to security restrictions, do not transmit drawings via E-mail or the internet. Transmittals with tight time constraints should be hand-carried or delivered using commercial services (FedEx or UPS, etc.) due to the time required for security screening of mail.

1.6 **MEETINGS:**

- A. **General:** All planning and design review meetings will be scheduled by the AOC Project Manager after receiving requests from any party involved with the Project.
 - 1. **Notice:** Issued by the AOC Project Manager.
 - 2. **Agenda:** Shall be prepared by the party requesting the meeting.
 - 3. **Minutes:** Shall be maintained and distributed by the AOC Project Manager for Projects that only involve AOC personnel, and by the Associate A/E for other projects.
 - a. Each item of work requiring action or resolution shall have the name of an individual tasked with completing that item, in "action log" format.
 - b. Items of "New Business" within the minutes for Design Phase and Construction Phase meetings shall be numbered consecutively, starting with 1.1 for the first meeting, 2.1, for the second, etc. Unresolved items from preceding meetings shall be carried under "Old Business" and shall carry their original item number.

- c. Parties taking exception or having corrections for any distributed minutes shall submit them to the authoring party within 5 working days of receipt of the minutes.
 - d. Minutes shall be distributed within 5 working days of each meeting.
 - e. The use of spreadsheet formats for minutes is encouraged.
4. **Telephone Conversations:** Telephone conversations and other informal conversations with the AOC wherein the discussions materially affect project scope, schedule, or cost shall be confirmed in writing to the AOC Project Manager.

1.7 ARCHITECT OF THE CAPITOL PERSONNEL:

A. Design & Construction Disciplines:

Director of Engineering:	Mr. Scott Birkhead, PE	(202) 226-5630
Asst. Director of Engineering:	Mr. William Weidemeyer, PE	(202) 226-5630
Director of Architecture:	Mr. Bruce Arthur, RA	(202) 225-3430
Director of Construction Management	Mr. Gary Vawter	(202) 226-2582
Director of Mechanical Branch:	Mr. Rick Khan, PE	(202) 226-3180
Director of Electrical Branch:	Ms. Annette Kim, PE	(202) 226-3471
Security Officer:	Mr. Russell J. Norris	(202) 228-2601
Director of Planning:	Mr. Terrel Emmons, FAIA	(202) 226-7125
Director of Technical Support Division:	Mr. John Weber, RA	(202) 226-4711
Director of Project Management Div.:	Mr. Larry Delaney, AIA	(202) 225-5900
Special Asst. for Project Management:	Mr. Stuart Pregnall	(202) 226-6109
Asst. Head, Elevator Branch:	Mr. Charles Aquilina	(202) 225-3988
Director Fire Protection Eng. Branch:	Mr. John Williams, PE	(202) 226-2645
Director of Electronics Division:	Mr. Robert Hoyler	(202) 224-9827

B. Executive Office for Facility Management:

AOC Fire Marshall:	Mr. Ken Lauziere, PE	(202) 226-3460
Safety & Environmental Division:	Mr. Larry Denicola, PE	(202) 226-6176

C. Building Superintendents:

US Capitol Building:	Mr. Carlos Elias	(202) 226-4859
Senate Office Buildings:	Mr. Lawrence Stoffel, PE	(202) 224-5023
House Office Buildings:	Mr. Frank Tiscione	(202) 225-7012
Library of Congress Buildings:	Mr. Stephen Ayers, AIA	(202) 225-3180
Supreme Court Building:	Mr. Marc Frampton	(202) 479-3143
US Botanic Garden Buildings:	Ms. Holly Shimizu	(202) 225-6670
US Capitol Power Plant:	Mr. Michael Keegan	(202) 225-4380

D. AOC Landscape Architect:

Mr. Mathew Evans, ASLA	(202) 224-6645
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E. Procurement Division:

Director	Ms. Cynthia Bennett	(202) 226-2557
Asst. Director:	Mr. Christopher Blumberg	(202) 226-2559
Head, Branch 1:	Ms. Carole Boucher	(202) 226-4526
Head, Branch 2:	Ms. Eleanor Deegan	(202) 226-4525

F. Office of General Counsel:

General Counsel	Mr. Charles Tyler, Esq.	(202) 225-1210
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G. Records Management Division: Mr. Ben Myers (202) 225-5581

H. Office of the Attending Physician:

AOC Sanitarian:	Mr. Wesley Mills	(202) 225-7993
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1.8 DESIGN MANUAL CONVENTIONS:

- A. Language:** Instructions provided in the imperative mode shall be considered as mandatory. Recommendations are stated using terms such as “should” or “may.” Bolding, underscoring, and leading italics are used for readability only. Terms which have special meaning within the A/E Design Manual (such as *Building Program*) and proper titles are italicized.
- B. Content Levels:** The A/E Design Manual is divided into Parts that equate to typical book Chapters. Part 4 is further divided into “lettered” sub-parts (4s, 4m, 4l and 4cm) , only one of which will be applicable to a given project as determined by project size and delivery technique. Each Part is further formatted using standard “outline” format into “articles” (4l.2) and paragraphs (4l.2J). Appendices follow the Parts to provide both examples of requirements and further detail.
- C. Cross References:** Cross-references are made by Part and Article.
- D. Approved Documents:** The A/E Design Manual contains documents approved by the Architect of the Capitol (AOC) and makes reference to other AOC-approved documents and industry standards. As necessary, the AOC will provide electronic copies of AOC documents.

1.9 CORRECTIONS:

- A.** Please forward corrections or suggestions for improvements to this manual:

Office of the Architect of the Capitol
Technical Support Division
Ford House Office Building
Washington, DC 20515

END OF PART 1

PART 2 - PROJECT PROGRAMMING

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- 2.1 PURPOSE
 - 2.2 PROJECT STATEMENT
 - | 2.3 FORMAL **PROGRAMS OF REQUIREMENTS**
 - 2.4 PROJECT BUDGET
 - 2.5 PROJECT SCHEDULE
 - 2.6 CLIENT APPROVAL

PART 2 - PROJECT PROGRAMMING

2.1 INTRODUCTION

- A. **The Building Program:** The AOC Project Manager will schedule an initial scope and planning meeting with the Client and the Superintendent's Project Coordinator to define the *Program of Requirements*. Information gained from that meeting and from research, and comparison with similar or preceding projects shall then be used to establish the draft *Program Statement*. The Professional Services Contract or the project Task Order will define both the project size and the required building quality level.
- B. **Project Size:** The AOC classifies projects as Small, Medium, Large, and Large Utilizing Construction Managers, and this manual provides differing processes for delivering each size of project.
1. **Small Projects:** Small projects typically involve only a single design discipline (with minor assistance provided by others), encompass short design frames (measured in days or hours), have construction cost ranges up to approximately \$250,000, are typically performed by agency design staff or under Task Orders by IDIQ consulting contracts, and are executed using a very abbreviated design process. Reviews are presented in sketch form or by check plots of the working documents. As many of these projects are system-related, they often do not involve a formal Congressional Client and may require only approval by the appropriate Superintendent's office. At a minimum, Small Projects will have a verified *Initial Project Statement* refined into a *Program Statement*. Additionally, the *Small Project Development Checklist* will be completed. (See Part 4s).
 2. **Medium Projects:** Medium projects involve multiple design disciplines, encompass somewhat longer design frames (but typically within a single fiscal year), have cost ranges from approximately \$250,000 to \$5 million, and are usually executed under ongoing IDIQ Contracts with Associate A/Es. They are executed using an abbreviated production process that typically involves only a single design phase and a single construction documents phase. At a minimum, Medium Projects shall have a verified *Initial Project Statement* refined into a *Program Statement* and a fully completed *Medium Project Development Checklist*. For Projects covered by formal Budget Requests, the *Program Statement* shall fully conform to the project description contained in the Budget Request (See Part 4m).
 3. **Large Projects:** Large projects involve multiple design disciplines, encompass multi-year time frames to execute, have cost thresholds exceeding \$5 million, usually require the services of Associated A/Es working under Professional Services Contracts with the AOC, and require a more traditional design process as described within the American Institute of Architects *Handbook of Professional Practice*. Large Projects shall have a verified *Initial Project Statement* refined into a *Program Statement* and a fully developed *Program of Requirements* that complies with the requirements specified in this Part.

4. **Large Projects Utilizing Construction Managers:** These projects amend the preceding paragraph to incorporate the involvement of a Construction Manager to assist in project design, costing/constructability, and delivery.
- C. **Building Quality Levels:** AOC buildings are classified as Principal, Support, or Service class structures. Consult the *AOC Design Standards* for applicable design requirements. The building quality levels are characterized as follows:
 1. **Principal Buildings:** Major, monumental buildings of historic significance and characterized by very long service lives (100 years +). These buildings typically directly house activities of Senators, Members of Congress and Supreme Court Justices, or house related agencies. Significant public traffic must be accommodated. These buildings embody the nature of the legislative and judicial processes and the historic fabric of our country's government.
 2. **Support Buildings:** Buildings of long service life (50 - 100 years) that support staff and related activities of the Congress, the Library of Congress or the Supreme Court. These buildings benefit from the use of durable materials with low maintenance but not of the finish levels provided for Principal Buildings.
 3. **Service Buildings:** Buildings with service lives of 25 to 50 years. Utilitarian buildings that support service and maintenance functions, generally requiring low maintenance finishes and materials more consistent with standard commercial practice.
- D. **Project Execution:** No project may proceed without a complete and approved *Program of Requirements*.

2.2 THE PROGRAM STATEMENT - ALL PROJECTS

- A. **Program Statement:** The *Program Statement* is composed of three parts: the *Project Description*, the *Project Justification*, and the *Project Schedule*.
- B. **Project Description:** The *Project Description* is a single paragraph that provides a brief overview of the project, highlighting the Client's general needs and scale of the project, its location, project schedule, and any special or unique features that may affect the project scope or cost. The *Program Statement* shall always note any requirements for abatement of hazardous materials that may be present. The *Initial Project Statement* shall be used as the synopsis for all Budget and Project Tracking descriptions.
 1. Location
 2. Project Scope.
 3. Project Size - Small, Medium, Large or Large with CM.
 4. Activity Functions with assigned square footage.
 5. Room types and adjacency matrices.
 6. Special or unique features: Special services or utilities required for this project.
 7. Project Schedule with phasing, if necessary.
 8. Historic impact.

- C. **Project Justification:** The justification explains the need for and the benefits to be derived from the project as well as the impacts from not doing the work or from schedule slippage.
- D. **Project Schedule:** The AOC Project Manager shall outline the amount of time required for: completion of design (including as required the retention of any consultants), for review and approvals of design, for bidding, and for execution of the construction of the project.
 - 1. **Date Required:** All Program Statements shall delineate completion date.
 - 2. **Project Schedule:** The Project Manager, working in conjunction with the Superintendent's Project Coordinator and the Office of the Assistant Architect, shall prepare a Project Schedule that details milestones for completion of tasks and Phases and their associated reviews and approvals. All Project Schedules shall include review and approval time allowances as specified within this *A/E Design Manual*.

2.3 FORMAL PROGRAMS OF REQUIREMENTS

- A. **Required Components:** When required by the Professional Services Contract or by an IDIQ Task Order, the Associate A/E shall prepare a formal *Program of Requirements*.
- B. **The Space List:** Prepare a standard spreadsheet (*Excel*) listing of all required elements for all spaces required in the project in conformance with the *AOC Pre-Design Manual*.
 - 1. Department
 - 2. Space Name
 - 3. Number of Stations
 - 4. NASF (Net Assignable Square Footage) per unit.
 - 5. Total NASF.
 - 6. Purpose.
 - 7. Proximity.
 - 8. Access and Adjacencies.
 - 9. Historic Impact.
- C. **Code Analysis:** Complete the Preliminary Code analysis identifying applicable Codes and Editions, Use Group classifications, and proposed building types.

2.4 PROJECT BUDGET

- A. **The Cost Estimate:** A Program Phase estimate shall be prepared in an elemental form using Uniformat II (ASTM E-1557-96). Estimates at this phase shall be prepared using basic elements, cost per square foot of gross floor area, city cost ratios, and applicable lump sum allowances. The cost estimate shall include an appropriate cost contingency based on historic agency trends for the type of work involved and the phase at which the estimate is being performed. All cost estimates shall be approved by the Technical Support Division. Escalation shall be calculated to the estimated mid-point of construction.
- B. **Total Costs:** Statements of Project Budget shall encompass all costs required to complete the project - direct and indirect:

1. **Property Acquisition:** Include any land costs; building costs; and miscellaneous - professional fees, advertising, etc.
2. **Professional Services:** Include planning; programming; A/E professional design services; miscellaneous professional services; construction management services; AOC CMD construction management services; AOC project management services; and reproduction/CBD announcements/photographic documentation; etc.
3. **Construction Costs:** Site & building preparation, demolition; anticipated general construction cost (alternates); hazmat remediation (including hazmat monitoring services); inflation to construction midpoint; construction contingency; testing services - air balance, commissioning, field tests; utility connection fees; permit fees - environmental; and record document preparation.
4. **Miscellaneous Expenditures:** Include temporary swing space costs; telecommunication costs; government ff&e (furniture, fixtures & equipment); government furnished security equipment; project phasing, and miscellaneous government (signage, etc.)
5. **AOC Project Contingency:** Provide as directed.

2.5 PROJECT SCHEDULE

- A. **General:** Using standard Gant charting methods, prepare an initial timeline for total project execution, including, at a minimum, design phases, AOC review periods, Client approval periods, procurement preparation and procurement phases, contract award, and construction time.

2.6 CLIENT APPROVAL

- A. **Client Acknowledgement & Approval:** Following review and approval by the Client, the Project Scope, Project Schedule, and Project Budget will be collected into a formal *Program of Requirements*. *No Project may proceed to design without a Program of Requirements approved in writing by the Client, authorized representative of the client agency or office, and Superintendent.* Work will not proceed through the process absent formal signoffs.
1. **Safety & Environmental Division:** All *Programs of Requirements* shall be reviewed and approved by the AOC Life Safety office.
 2. **Food Service Systems:** All food service systems shall be reviewed and approved by the AOC Sanitarian.
- B. **Changes in Program Scope or Schedule:** Associate A/Es are not authorized to alter or change project scope or diverge from the *Program of Requirements* without written approval and authorization of the AOC Project Manager and the Client. All proposed changes to scope shall be accompanied by a statement of impact to Project Schedule and Project Budget, if required.
1. **Value Engineering:** Modifications proposed as a result of value engineering studies shall require full Client approval prior to the modification of any *Program of Requirements provision* and prior to incorporation into the project design.

END OF PART 2

PART 3 - ASSOCIATE ARCHITECTS/ENGINEERS

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- 3.1. **GENERAL**
 - 3.2 **ASSOCIATE ARCHITECT/ENGINEER RESPONSIBILITIES**
 - A. General
 - B. Responsibilities of Associate A/E
 - C. Design Within Budget
 - D. Errors and Negligent Performance
 - E. Field Investigation
 - F. AOC Provided Data
 - 3.3 **DESIGN START-UP**
 - A. Pre -Design Conference
 - B. Quality Assurance Program
 - 3.4 **CONSULTANT EVALUATIONS**

PART 3 - ASSOCIATE ARCHITECT/ENGINEERS

3.1 INTRODUCTION

- A. **General:** This Part addresses general responsibilities of the Associate Architect/Engineer and its relationship with the AOC Project Manager. It is intended to compliment the requirements contained in the Professional Services Contract or IDIQ Task Order.

3.2 ASSOCIATE ARCHITECT/ENGINEER RESPONSIBILITIES:

- A. **General - Pre-Contract Meeting:** Prior to development of the final Professional Services Contract or IDIQ Task Order, the AOC Project Manager will meet with the firm to discuss the project and the scope of services required. Topics to be covered include:
1. **Project Scope:** Presentation of the *Project Scope* and *Program of Requirements*. If the Contract or Task Order will require Associate A/E production of a *Program of Requirements*, then the requirements for that work will be provided.
 2. **Project Schedule:** The required *Project Schedule* and a discussion of how the Associate A/E plans to meet that schedule. Milestones for Project design phase reviews and completion of construction and bidding documents shall also be identified.
 3. **Project Budget:** A presentation of the total *Project Budget*, the portions of funding allocated to design services and to estimated construction contract cost (the project's funding limitation).
 4. **A/E Services:** A discussion of the scope of professional services required and the services of mechanical, electrical, structural, cost estimating, food service and other consultants that may be required for a given project.
 5. **Project Team:** Relationship of the Associate A/E's staff to the project with identification of principal-in-charge, managers, and other key personnel.
 6. **Compensation:** A discussion of fees, reimbursable costs, and inspection services.
 7. As appropriate, a visit to the project site.
- B. **Responsibilities of the Associate A/E:** The Associate A/E shall be responsible for the professional quality, technical accuracy, and coordination of the project design, including the Construction Documents, and other services furnished under the Professional Services Contract or Task Order. The Associate A/E shall, without additional compensation, correct or revise errors or deficiencies in the project design, including the Construction Documents, and other services furnished under the Professional Services Contract or Task Order. The Government's review, approval, acceptance of, or payment for any of the services required under the Professional Services Contract or Task Order, shall not be construed as a waiver of any rights under the Professional Services Contract or Task Order or of any cause of action arising out of the performance of the Professional Services Contract or Task Order. The use of a particular criteria requirement, unless specifically prescribed by the Government, shall not release the Associate A/E from responsibility for professional quality and technical accuracy.

- C. **Design Within Funding Limitations:** The Associate A/E shall accomplish the design services required under this contract so as to permit the award of a construction contract, using the AOC's standard procurement documents and procedures for the construction of the facilities designed at a price that does not exceed the funding limitation price as set forth in the Professional Services Contract or Task Order. Acceptance of the Professional Services Contract or Task Order and the Government scope by the Associate A/E acknowledges that the project can be designed within available funding to the quality standards specified.
1. **Monitor Cost:** The Associate A/E shall promptly advise the AOC if it finds that the project being designed will exceed or is likely to exceed the funding limitation and it is unable to design a usable facility within this limitation. Upon receipt of such information, the AOC will review the Associate A/E's revised estimated construction contract cost. The Associate A/E may, if he determines that the estimated construction contract cost required to be submitted in this contract is so low that award of a construction contract not in excess of the funding limitation is improbable, request a change in scope or materials as required to reduce the estimated construction cost to an amount within the funding limitation set forth in Professional Services Contract or Task Order, or the AOC may adjust such funding limitation if funds are available. When bids or proposals are not solicited or are unreasonably delayed, the AOC will prepare an estimate of constructing the design submitted and such estimate shall be used in lieu of bids or proposals to determine compliance with the funding limitation.
 2. **Bid Options:** Should tight market conditions or project scope require solicitation of bids when project cost estimates approximate funds available, the Associate A/E shall submit a listing of Bid Options (alternates) to the AOC for approval. The determination of items to be included as Bid Options shall ensure that the resultant Base Bid scope will both ensure that fundamental Government needs detailed in the appropriation are satisfied while simultaneously ensuring that bids will be received within funding limitations. To preserve bidding practicality, Bid Options shall be limited to no more than five (5).
 3. **Re-Design:** When bids or proposals for the construction contract(s) are received that exceed the funding limitation, the Associate A/E shall perform such re-design and other services as are necessary to permit contract award within the funding limitation. These additional services shall be performed at no increase in the price of this contract. However, the Associate A/E shall not be required to perform such additional services at no cost to the Government if the unfavorable bids or proposals are the result of conditions beyond its reasonable control, in the opinion of the AOC.
 4. **Planning or Programming Projects:** The preceding requirements shall not apply for Projects when project costs have not been developed at the time of A/E contract award.
- D. **Errors and Negligent Performance:** Design errors or omissions which result in damages or extra cost to the Government, will be evaluated for potential Associate A/E financial liability. If the AOC determines that the Associate A/E is financially liable for a design deficiency, the Associate A/E will be so advised by official correspondence. The Associate A/E shall be, and remain liable to the Government, in accordance with applicable law, for damages to the Government caused by the Associate A/E's negligent performance of any of the services furnished under the Associate A/E contract. The preferred method of settlement of Associate A/E financial liability is for the Associate A/E to negotiate directly with the Construction

Contractor. Where the Associate A/E cannot reach an agreement with the Construction Contractor or if the Associate A/E declines to negotiate, the AOC will arrange settlement directly with the Construction Contractor and will bill the Associate A/E.

3.3 DESIGN STARTUP:

- A. **Pre-Design Kick-Off Meeting:** After completion and Client approval of the *Program of Requirements*, a pre-design conference with all involved parties shall be held. This conference shall involve the Jurisdiction Project Coordinator, AOC Project Manager, Associate A/E and his team, and Project Construction Manager.
1. **Review *Program of Requirements*:** Clearly identify the Client, the project goals, review the scope or program, clearly establish project quality requirements and the project budget. Ensure that the project designer has resolved any issues regarding the *Program of Requirements* prior to commencing work. **G**
 2. **Finalize *Delivery Schedule*:** Review Project Schedule and identify milestones, required deliverables, review procedures, requirements for back-checking and resolution of comments prior to phase advancement, and requirements for completion. **G**
 3. **Total Project Budget:** Confirm the budget reporting format, the major components to be tracked, and the options to be tracked separately. **G**
 4. **Finalize *Teams & Project Directory*:** Identify roles and responsibilities of all team members. Circulate the list of team member names, addresses, telephone numbers, and E-Mail addresses. Review E-mail protocols. **G**
 5. **Identify *Contract Responsibilities*:** Review the applicable *Task Order* or *Professional Services Agreement* and ensure that responsibilities are understood. Discuss formats for document production and delivery and clarify A/E responsibilities for construction administration (if any). **G**
 6. **Identify *Client Responsibilities*:** Identify Client responsibilities for furniture, fixtures and equipment, location and sufficiency of any required swing space, move coordination, power disruption approvals, etc. **G**
- B. **Quality Assurance Program:** Following the completion of the *Pre-Design Kick-Off Meeting*, the Associate A/E shall prepare the following for submission and approval prior to commencing design:
1. **Outline of Associate A/E Action Plan.** Prepare a plan detailing the steps to be undertaken during the design and construction process to ensure that project drawings and specifications are rigorously reviewed and coordinated. At each step list which QA actions will be undertaken. Include with each step of the plan an appropriate space where a senior member of the firm can initial and date that the required QA action has been accomplished. Detail the means by which non-conforming data will be corrected and verified. At submission of the 100% design documents, submit the latest “marked-up” check-set documents (drawings, specifications, etc.), necessary to ensure that a thorough review QA effort has been completed and that all AOC review comments have been satisfied.

2. **Design Time Line:** Prepare a detailed time line and resource plan for the A/E and its consultants and subcontractors that complies with the *Project Schedule* agreed to at the *Pre-Design Kick-Off Meeting*. Show required review milestones and personnel loading against design activities. Ensure that required review and approval periods are included. A standard bar-chart is an acceptable format for presenting the required time line.
- C. **Design Phase Field Investigation:** During design, the A/E shall visit the project site only after making arrangements with the AOC Project Manager or his designee. The AOC Project Manager will serve as the liaison with the Client and will coordinate communications and reviews for the project.
 1. Site investigations shall verify all conditions, dimensions, and locations in the Project Area which may be affected by the proposed work or which may affect the proposed work. Any site conditions noted that are in variance with the scope or building program shall be immediately presented to the AOC Project Manager for resolution.
 2. The Associate A/E shall not rely solely on existing information, such as record drawings or as-built drawings for either a new project or a renovation to an existing facility.
 3. A/E site investigations shall identify or verify potential hazardous materials.
- D. **AOC Provided Data:** In addition to the *Program of Requirements* and its associated data, the AOC Project Manager will make available, as appropriate to the given Project, the following data and information:
 1. **Drawings:** The AOC will provide a listing of both traditional paper or film drawings available in agency archives for areas of the Capitol Complex covered by the project scope. The Associate A/E shall review the available drawings with the Records Management Division and shall identify which drawings are required for their use and submit a listing to the AOC. The AOC will make available a single copy of each approved drawing.
 - a. **Records Management:** Archival drawings are maintained by the AOC Records Management Division. The Associate A/E shall coordinate all meetings with the Records Management Division through the AOC Project Manager.
 2. **Computer-Aided Design Drawings:** As available, the AOC will make available electronic copies of applicable plans and details for existing buildings or building areas affecting the project. Such data will be presented in Bentley Systems' *MicroStation* .DGN format and by means consistent with AOC security procedures. As applicable, the AOC will additionally furnish default AOC cell libraries for agency symbols and title blocks, and menus that support agency leveling schemes.
 3. **Geotechnical Data:** Soil borings will be provided by the AOC (or may be required under the *Task Order or Professional Services Contract*), but interpretation of those borings shall remain the responsibility of the Associate A/E.
 4. **Fire Protection Water Flow Tests:** The AOC will perform water flow tests on existing water supply system(s) in order to determine the adequacy of the water supply for the expected demands. The findings will be presented in a format consistent with NFPA 13.

5. **Utility Connections:** The Associate A/E shall meet with local electrical power and water service utilities to verify availability of services. The Associate A/E shall advise the AOC of any required permits or fees in a timely manner so as to not delay the project.

3.4 CONSULTANT EVALUATIONS:

- A. **Performance Evaluation:** At completion of the Project, the AOC Project Manager is required to complete *Standard Form 1421, Performance Evaluation (Architect-Engineer)*, for the design team on the Project. The AOC reserves the right to distribute these forms to other agencies of the Federal Government.
 1. **Interim Evaluations:** On Large Projects, the AOC Project Manager may provide interim evaluations on a case-by-case basis.

END OF PART 3

PART 4s - DESIGN REQUIREMENTS FOR SMALL PROJECTS

-
- 4s.1 INTRODUCTION**
 - 4s.2 DESIGN AND CONSTRUCTION DOCUMENTS PHASE**
 - 4s.3 PROCUREMENT PHASE (AS APPLICABLE)**
 - 4s.4 CONSTRUCTION PHASE (AS APPLICABLE)**
 - 4s.5 CONSULTANT PROJECT CLOSEOUT**

PART 4s - DESIGN REQUIREMENTS FOR SMALL PROJECTS

4s.1 INTRODUCTION

- A. **General:** Design and construction document phases for Small Projects shall be combined into a single phase. Small projects designs may be prepared by AOC staff or by Associate A/Es employed under indefinite delivery/indefinite quantity contracts (IDIQ).
- B. **Level of Detail:** All projects shall be designed and contract documents prepared as if the resulting construction is to be executed by non-AOC forces. Reuse of existing AOC master plans and adaptation of standard details is a prerequisite of work on Small projects, to both ensure adherence to agency standards and to conserve time.
 - 1. Most Small Projects will be constructed by either Superintendent staff or by the AOC Construction Branch, although the documents should support elevation to SOC contracting.
- C. **Pre-Design Kick-Off Meeting:** As required by Part 3 and prior to commencement of the Design phase and, the Associate A/E shall meet with the AOC Project Manager. **G**
- D. **Project Schedule:** In conformance with Part 3 and the agreements reached at the Kick-Off Meeting, Associate Architects/Engineers, prepare a time line and resource plan for the Project showing all required resources. Start/Finish dates may be substituted for formal time lines for projects involving only one discipline and estimated to be performed in less than 80 hours. **G**
- E. **Preliminary Code Analysis:** The Associate A/E is responsible for compliance of the design with of Code requirements. At a minimum, the Preliminary Analysis shall define the following: **G**
 - 1. Applicable Code and Edition applied to the analysis,
 - 2. Use Group Classification (s) for the facility and major parts thereof,
 - 3. Proposed type of Construction Classification,
 - 4. Accessibility regulations to be applied.
 - 5. Renovation Projects: Ensure that work to be performed in existing buildings is consistent with existing Code classifications, interpretations, and does not violate variances.
 - 6. **Preliminary HazMat Assessment:** Conduct field surveys as required to supplement any existing conditions documents forwarded by the AOC Project Manager. **G**
 - a. **Hazardous Material Identification:** Review existing asbestos and lead test results provided by the AOC. Perform additional testing for lead-based paint and asbestos-containing materials as necessary to determine the extent of hazardous materials to be encountered during the construction of the project. A certified inspector must be used to obtain the required number of bulk asbestos and/or lead-based paint

samples in the areas affected by the project, and submit the samples to a certified laboratory for analysis. The asbestos samples must be analyzed using either polarized light microscopy (PLM) with dispersion staining (EPA Method 600/R93-116) or transmission electron microscopy (TEM) for non-friable organically bound bulk samples (NY ELAP Method 198.4). Provide a report that reflects both the reliance on past testing and the results of any additional analysis, and include quantities of the hazardous materials found.

- b. *Waste Stream Samples:* To address EPA regulatory concerns, take a representative sample of the waste stream to be generated and perform Toxicity Characteristic Leaching Procedure (TCLP) testing (EPA Method 1311) to determine if the lead/heavy metals in the wastes should be managed and disposed of as hazardous waste; or determine through appropriate calculations that the lead/heavy metal content cannot exceed the TCLP limit for hazardous waste.
- c. *Abatement:* Incorporate appropriate abatement, monitoring, and disposal procedures into the design documents.
- d. *Hidden Hazards:* Incorporate standard language related to hidden hazards (see AOC Division One).

4s.2 DESIGN AND CONSTRUCTION DOCUMENTS PHASE

- A. **Design and Construction Documents Phase:** Other than very simple free-hand sketches or simple CAD drawings, the initial design CAD files are also used to develop the final construction documents, similar in concept to “leaving the vellum taped down” from start to finish.
 - 1. **Mid-Point Review:** For purposes of scheduling and preparation of the Associate A/E’s fee proposal, plan for one check review at the consultant’s office with the AOC Project Manager and appropriate AOC Task Leaders. This mid-point review may be conducted using standard check plots or “yellow-line” correction sets. The intent of this review is to confirm progress while minimizing the expenditure of time by Team members. **G**
- B. **Construction Documents:** As these projects typically involve only a single or few trades, inter-discipline coordination is rudimentary. Required documents include:
 - 1. **Drawings:** Submit for approval project drawings (plans, elevations, sections, and details) 100% complete, with 1/4" scale preferred as a practical minimum scale for floor plans. Wherever practicable use the AOC’s 22" x 34" title blocks designed for half-size plotting to 11" x 17". **G**
 - 2. **Space:** Space tabulations (if applicable) verifying compliance with building program or with duly authorized modifications thereto. Clearly summarize final Code analysis on the drawings or by written documentation, as applicable. **G**
 - 3. **Calculations:** Attach copies of all required calculations to the *Project Folder*. **G**
 - 4. **Specifications:** Project Specifications are usually reduced to detailed drawing notes. Adhere to all AOC requirements with respect to FAR restrictions on use of brand names and inspection labeling. For projects that may require portions sub-contracted to private contractors, provide short-form specifications for the required work. Where possible,

utilize drawing notes to specify materials or installation requirements. Projects prepared for Solution Order Contracts (SOC) award shall require preparation of SOC Short-form Division 1, General Requirements, sections. **G**

5. **Cost Estimate:** Submit a construction cost estimate prepared in accordance with ASTM E-1804, *Standard Practice for Performing and Reporting Cost Analysis During the Design Phase of a Project*, Paragraph 6.5, *Construction Document Phase Estimate*. Prepare the estimate using Unifomat II, Level 4 (ASTM E-1557) based on 100% construction document floor plans, specifications for all materials, finishes, and building, mechanical, and electrical systems. Include detail reports with full crew resource loading. Do not include any design contingency. Perform value engineering analysis as required to ensure bidding within funding limitations and to assist in definition of any necessary Bid Options. **G**

C. Documents Review and Final Deliverables:

1. **Progress Reviews:** Design and construction document review will be conducted informally, as required, using standard “check plots,” produced as necessary. For very minor work review may be performed “on-screen.”
2. **Final deliverables:** At completion of the design and construction documents work, submit the following:
 - a. Provide a one complete set of vellum reproducible, plotted at full-size, ready for final reproduction and bidding and a minimum of 5 bound sets, or the number enumerated in the Professional Services Contract or Task Order, of drawings. **G**
 - b. Provide 5 sets, or the number enumerated in the Professional Services Contract or Task Order, of calculations, and cost estimates bound into 8 -1/2" x 11" brochures. **G**
 - c. Provide one camera-ready, unbound copy original of the Project Manual and 5 bound copies. **G**
 - d. Deliver required databases on standard *MS Windows NT* or *XP* formatted 3-1/2" floppy disks, CD-ROM, or ZIP disks. Deliver other required deliverables in accordance with applicable Parts of this A/E Design Manual. **G**

- D. **Kick-Off Review Conference:** The Associate A/E shall conduct a formal, technical “overview” presentation to the AOC Project Team following the AOC document distribution period. **G**

- E. **AOC Discipline Review Conference:** The Associate A/E shall allow a minimum of 5 calendar days for AOC review following the Kick-Off review conference and then meet with individual design discipline teams to fully discuss each discipline’s work. **G**

- F. **Wrap-Up Review Conference:** A minimum of 5 calendar days after the Discipline Review Conference, the Associate A/E shall meet with the AOC to discuss and clarify preliminary comments prior to comment consolidation and delivery to the Associate A/E. Review comments will be forwarded to the Associate A/E using the standard AOC spreadsheet format. The Associate A/E shall respond to comments within 5 calendar days. **G**

- G. **Construction Documents - Backcheck:** Correct 100% construction documents to incorporate revisions to comply with final AOC review comments. **G**

4s.3 **PROCUREMENT PHASE (AS APPLICABLE)**

- A. **General:** These projects will generally be executed by Superintendent staff or by the AOC Construction Branch. Conventional bidding activities, as such, will normally not be required. The AOC's Project Manager will work with the Superintendent's offices and agency contractors to schedule the work. If elevated to a SOC contract, the AOC will work with agency SOC contractors to negotiate the construction contract.
- B. **Preparation of Addenda:** Formal addenda, as such, are not envisioned in this scale of project. Clarification will be issued as using standard Request for Interpretation (RFI) procedures addressed to the AOC Project Manager. **G**
1. ***Request for Interpretation:*** The Project Manager is responsible for processing and resolving any RFIs, in consultation with the Associate A/E. **G**

4s.4 **CONSTRUCTION PHASE (AS APPLICABLE)**

- A. **General:** This section addresses jointly shared construction administration responsibilities provided for Small Projects - distributed between the AOC Project Manager, the AOC Construction Manager, and as provided in the Professional Services Contract or Task Order, the Associate A/E. The provisions are prefaced on projects procured via formal Invitation for Bids or Requests for Proposals. Occasionally, Small projects also may be constructed through the use of Solution Order Contracts (SOC). (For projects constructed under SOC contracts, consult the processes detailed in Part 4m, Medium Projects).
1. ***Professional Services Contract:*** Services in this section are dependent on option for Construction Administration being exercised in the Professional Services Contract or Task Order.
2. ***Document Annotation:*** Update with appropriate annotation all construction documents to reflect modifications issued during the Bid period and to reflect any Options exercised by the AOC.
- B. **Mobilization/Project Startup:**
1. **Pre-Construction Meeting:** The AOC Project Manager will conduct the meeting, take and distribute minutes. Agenda items include: the introduction of the team, enumeration of required submittals, explanation of required processes, explanation of site restrictions, and discussion of required quality assurance procedures.
2. **Construction Schedule:** The AOC Project Manager will provide oversight of the Construction Schedule and coordination of any Government provided work.

C. Projects Controls and Decision Expediting:

1. **Request for Interpretation (RFI):** The AOC Project Manager with the assistance of the Associate A/E is responsible for processing and resolving RFIs.
2. **Processing of Submittals:** The AOC Project Manager, will, as necessary, process and forward to the Associate A/E for review, any required submissions of product data, shop drawings, calculations, coordination drawings, samples, and mock-ups for compliance with Contract Documents. The Associate A/E shall annotate submittals and recommend disposition (approval, rejection, etc.) to the AOC Project Manager.
 - a. **Processing Time:** Submittals will be reviewed and processed by the Associate A/E within 14 calendar days of receipt (including submittals to sub-consultants). Submittals that require coordination with other submittals will be held until all required submissions are received.
3. **Certifications and Test Reports:** The AOC Project Manager will review and approve all Contractor certifications and test reports.
4. **Field Meetings:** The AOC Project Manager will conduct the required field meetings, compile the minutes and distribute them to the parties involved. Duplication of multiple sets within organizations represented shall be the responsibility of each organization.
5. **Field Observation:** As necessary, the Associate A/E may accompany the AOC Project Manager on periodic site visits and conduct on-site observations of the Work. This observation may coincide with the dates of the Field Meetings.
6. **Construction Modifications (Change Orders):** The Project Manager will, as necessary, process and forward to the Associate A/E for review, all Change Order requests. The Change Order request shall be analyzed for conformance with design intent, consistency, fair cost, and the effect on project schedule. Requests for “approved equals” will not be accepted as the basis for change order requests.
7. **Requests for Payment:** The AOC Project Manager process all payment requests.

D. Project Closeout:

1. **FFE Coordination:** Coordination of Government furnished furniture, fixtures, and equipment shall be provided in accordance with the Professional Services Contract or Task Order. The AOC will furnish required listings of required items and of agency representatives appropriate to the items covered.
2. **Punch Lists:** The AOC Project Manager will prepare the project “punch-list,” make assignments as to whom is responsible to resolve each punch-list item, and recommend to the AOC completion of required elements on the list.
3. **Closeout Submittals:** *[Future]* O & M manuals, warranties, etc.
4. **Equipment Startup (Commissioning):** *[Future]*

4s.5 CONSULTANT PROJECT CLOSEOUT

- A. **General:** As part of final project closeout collect, organize, and transmit to the AOC any revisions to specifications, construction modifications, Requests for Interpretation; etc. that have not been previously delivered to the AOC.
- B. **As-Built Documentation:** If the Professional Services Contract or Task Order requires Associate A/E preparation of “as-built” CAD files incorporating all field revisions and construction modifications update the appropriate construction drawings and forward electronic copies to the AOC. If the Professional Services Contract or Task Order requires review and approval of “as-built” CAD data prepared by others, complete that review and transmit findings to the AOC.
- C. **Final Payment to Associate A/E:** Following delivery and AOC approval of Consultant Closeout documentation, prepare and submit request for final payment.

END OF PART 4s

PART 4m - DESIGN REQUIREMENTS FOR MEDIUM PROJECTS

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- 4m.1 **INTRODUCTION**
 - 4m.2 **PROJECT STARTUP:**
 - 4m.3 **DESIGN PHASE**
 - 4m.4 **CONSTRUCTION DOCUMENTS PHASE**
 - 4m.5 **BACKCHECK SUBMISSION**
 - 4m.6 **BID PHASE (AS APPLICABLE)**
 - 4m.7 **CONSTRUCTION PHASE (AS APPLICABLE)**
 - 4m.8 **CONSULTANT PROJECT CLOSEOUT**

PART 4m - DESIGN REQUIREMENTS FOR MEDIUM PROJECTS

4m.1 INTRODUCTION

- A. **General:** Medium Projects represent a significant portion of the dollar volume of the AOC's workload but do not in themselves demand or support the design phase resources required under traditional A/E contracts. Because the projects are of more limited scope, the multiple iterative design review and revision submissions are rolled into a single unit of work with the designer developing the design directly from the Scope and *Program of Requirements* and informally working directly with the Client to evolve the final design from which the construction documents may be produced. Medium Projects usually have a short time frame attached to their execution and are usually less complex than Large Projects. Thus, this Chapter of the *A/E Design Manual* has been developed to address the reduced scope deliverables required for this scale of work.
1. Programming Phase (As required by the *Professional Services Contract* or *Task Order*).
 2. Design Phase.
 3. Construction Documents Phase.
 4. Procurement Phase.
 5. Construction Administration Phase (As required by the *Professional Services Contract* or *Task Order*).
- B. **Level of Detail:** Projects shall be designed and construction documents prepared as if the resulting project is to be formally bid. Most projects developed under standard contracts will be constructed using either Construction Branch or SOC contracts, although they may be elevated to formal open bidding (IFBs) or directed to construction by agency resources.
- C. **Pre-Submittal Reviews:** Prior to the completion of the design phase and prior to printing of review sets, meet with the AOC Project manager to review the available drawings and documents for the purpose of developing a list of documents for reproduction and submission for review. Where possible, this meeting will be held at such time as to permit document reproduction without infringing on the AOC review period. Allow for a minimum of 10 working days review by the AOC at each phase.
- D. **Incorporation of Review Comments:** All review comments shall be incorporated into work subsequent to each submittal and *prior to commencement of the next phase*. All comments shall be responded to in writing to clearly state the action the Associate A/E will take in response to each comment. If the Associate A/E takes exception to a review comment, the issue shall be clearly presented so that the issue may be resolved by the AOC. Responses to AOC review comments shall be entered into the AOC-provided computer spreadsheets to enable consistent tracking of related comments throughout the life of the project. Clarify "Will Comply" responses with actions to be undertaken. (See Appendix 4A).

1. **Backcheck Sets:** Submission of backcheck sets verifying incorporation of AOC comments shall be limited to sheets or specification sections affected by those comments and to two sets of same for review by the AOC Project Manager. The 100% construction documents backcheck submission shall be a complete construction documents set.

4m.2 PROJECT STARTUP:

- A. **Pre-Design Kick-Off Meeting:** As required by Part 3 and prior to commencement of the Design phase, the Associate A/E shall meet with the AOC Project Manager, review the *Program of Requirements*, the Schedule, the Budget, the Team and administration responsibilities. **G**
- B. **Consultant Approach:** The Associate A/E shall examine the *Program of Requirements*, AOC standards and requirements and prepare a Project Execution Plan that summarizes the firm's approach to executing the work, and enumerates the major design standards to be used and how they will be applied to the Project. **G**
 1. **Existing Conditions Documentation:** If specified within the *Professional Services Contract* or *Task Order*, the Associate A/E shall survey the existing facility, either field measure existing rooms and spaces and create drawings or review AOC provided drawings of rooms and spaces. Document critical discrepancies and modify the drawings to accurately reflect existing conditions, and analyze existing structural, mechanical, electrical, and life safety systems and document each to the extent required for execution of the Project. **G**
- C. **Project Schedule:** Prepare a proposed project schedule and resource plan for the Project showing all required Associate A/E and AOC resources. Provide for all required review periods. Include each design phase, procurement phase, full construction phases, and commissioning activities. A standard Gant chart (bar-chart) is an acceptable format for presenting the required time line. **G**
- D. **Preliminary Code Analysis:** The Associate A/E is responsible for the initial determination of Code requirements. If the Professional Service Contract or Task Order requires the services of a Code Consultant, coordinate that consultant's findings with all members of the design team. At a minimum, the Preliminary Analysis shall define the following: **G**
 1. Applicable Code and Edition applied to the analysis,
 2. Use Group Classification (s) for the facility and major parts thereof,
 3. Proposed type of Construction Classification,
 4. Accessibility regulations to be applied.
 5. Renovation Projects: Ensure that work to be performed in existing buildings is consistent with existing Code classifications, interpretations, and does not violate variances.
 6. Mechanical code evaluation to address ventilation and exhaust requirements and how they will be achieved.
 7. Electrical code evaluation to address lighting levels and emergency power requirements and how they will be achieved.

8. Life safety code evaluation to address fire alarm and fire suppression systems and how they will be addressed. Include an evaluation of code mandated smoke control systems.
9. Electrical equipment installation requirements and how they will be addressed.
10. **Preliminary HazMat Assessment:** Conduct field surveys as required to supplement any existing conditions documents forwarded by the AOC Project Manager. **G**
 - a. **Hazardous Material Identification:** Review existing asbestos and lead test results provided by the AOC. Perform additional testing for lead-based paint and asbestos-containing materials as necessary to determine the extent of hazardous materials to be encountered during the construction of the project. A certified inspector must be used to obtain the required number of bulk asbestos and/or lead-based paint samples in the areas affected by the project, and submit the samples to a certified laboratory for analysis. The asbestos samples must be analyzed using either polarized light microscopy (PLM) with dispersion staining (EPA Method 600/R93-116) or transmission electron microscopy (TEM) for non-friable organically bound bulk samples (NY ELAP Method 198.4). Provide a report that reflects both the reliance on past testing and the results of any additional analysis, and include quantities of the hazardous materials found.
 - b. **Waste Stream Samples:** To address EPA regulatory concerns, take a representative sample of the waste stream to be generated and perform Toxicity Characteristic Leaching Procedure (TCLP) testing (EPA Method 1311) to determine if the lead/heavy metals in the wastes should be managed and disposed of as hazardous waste; or determine through appropriate calculations that the lead/heavy metal content cannot exceed the TCLP limit for hazardous waste.
 - c. **Abatement:** Incorporate appropriate abatement, monitoring, and disposal procedures into the design documents.
 - d. **Hidden Hazards:** Incorporate standard language related to hidden hazards (see AOC Division One).

4m.3 DESIGN PHASE

- A. **General Design Phase:** All design studies and engineering calculations required to design Medium Projects are to be accomplished during a single phase design period. Required submissions during design do not anticipate multiple submissions or reviews. At completion of the design phase, as appropriate to the project type, submit the following:
 1. **Design Commentary:** Provide narrative descriptions of various features and a listing of any differences between the *Program of Requirements* and the proposed design. Summarize the features of the building envelope, major structural systems, principal interior finishes, historic considerations, mechanical systems, electrical systems, conveying systems, fire alarm/life safety systems, security and telecommunication systems. Clearly summarize preliminary Code analysis on the drawings or by written documentation. **G**
 2. **Space Studies:** Submit tabulations contained in a standard spreadsheet containing at a minimum the following data or database fields: **G**

- a. Title Block
- b. Project Name
- c. Project Number
- d. Gross Project Square feet
- e. Program Space Name
- f. Program Net Assignable Square Footage for each Space.
- g. Design Space square feet
- h. Design Net Assignable Square Footage for each Space.
- i. Variance between Program and Design assignable areas.

- B. **Pre-Submission Procedures:** Prior to production of the review sets, the AOC Project Manager shall meet with the Associate A/E to review one complete set of documents and verify that the intended submittal possesses the information required for the AOC's review process. **G**

- C. **Design Drawings and Calculations:** Develop design to the stage normally prepared for *Design Development* and submit drawings for the following:

1. **Site Plans:** As applicable, provide narrative describing site circulation and access concept, utility distribution scheme, drainage concept, and landscape design concept. Provide reasoning for plant selection and proposed landscape maintenance/watering plans. Identify borrow/disposal sites and any required permits. **G**

- a. **Drawings:** As applicable, provide the following at appropriate scales:

- 1) **Site Layout Plan:** Show extent of improvements, adjacent buildings, existing and proposed contours, surface drainage, parking facilities as appropriate, site access, traffic circulation, and site furnishings. **G**
- 2) **Site Utilities Plan:** Show existing and proposed sizes and locations/tie-ins of all utilities, including domestic and fire protection water lines, sanitary sewer lines, and steam and chilled water tunnels/lines. **G**
- 3) **Landscape Design Plan:** Define total scope of landscaping, locate major existing trees and features scheduled to remain, proposed planting beds, and irrigation systems as applicable. **G**

- b. **Calculations:** As applicable, provide site and building storm drainage calculations, parking calculations, and dewatering calculations. **G**

2. **Architecture:** Provide a narrative discussion by system to address building massing, circulation and access to major spaces, justification for major materials and finishes to be used, justifications for any project-dependent proprietary products, planned methods/systems for exterior maintenance, and a list of options being proposed to control scope/cost. Address incorporation of all Government-provided furniture, fixtures, and equipment. **G**

- a. **Drawings:** As applicable, provide the following at appropriate scales:

- 1) *Floor Plans:* Double line plans for each floor and typical floor showing rooms, departmental areas and agencies, and identifying each room or space. Show vertical pipe and duct spaces, columns, and other principal features. Show special equipment areas at enlarged scale. **G**
 - 2) *Elevations:* Elevation drawings of each exterior elevation of the structure (at scales consistent with the floor plan drawings), indicating materials and fenestration illustrating architectural character and building massing. **G**
 - 3) *Building Sections:* Building sections and typical wall sections, indicating floor-to-floor heights, vertical systems, etc. **G**
 - 4) *Schedules:* Include a preliminary schedule of floor, wall, and ceiling finishes proposed for typical rooms and spaces. Clearly indicate any Government furnished or installed equipment in schedules. **G**
- b. *Calculations:* As applicable, provide exterior envelop dew point calculations, acoustical calculations, and toilet fixture counts. **G**
3. ***Structural Systems:*** Provide a narrative discussion of framing and foundation system. Clearly identify design criteria employed. List all live, dead, and wind loads utilized. Include soils investigation and materials report. **G**
 - a. *Drawings:* As appropriate, provide framing plans, at same scale as architectural floor plans, and key details. **G**
 - b. *Calculations:* Provide gravity load, lateral load, foundation and vibration calculations; and evidence the design is not subject to progressive collapse. Evaluate design for seismic loads. For all computer generated results, submit a model of the input data and program material to allow understanding of the output. **G**
4. ***Mechanical Systems:*** Provide a narrative discussion of the HVAC system general features, configuration, rationale for selection, and how it integrates with architectural building systems. As appropriate to the project, discuss recommended energy sources and conservation. Provide notation of outdoor summer and winter design conditions, and indoor design conditions and special requirements, indoor relative humidity design conditions, ventilation requirements, and special requirements, building block heating and cooling loads, and ventilation requirements calculations. **G**
 - a. *Drawings:* As applicable, provide the following at appropriate scales:
 - 1) *Mechanical Floor Plan:* Provide floor plan, at same scale as architectural floor plans, that shows the main distribution systems for both ducts and mechanical piping. Define all required mechanical spaces. For alterations, clearly show connections points to existing systems. **G**
 - 2) *Plumbing Floor Plan:* Provide a diagrammatic floor plan for each floor, at same scale as architectural floor plans, that shows main supply and soil routing for domestic water systems. Discuss specialized areas. **G**

- b. *Calculations:* Provide computerized building energy analysis. Report energy broken into five categories: heating, air conditioning, lighting, domestic hot water, and other (summarize items included in “other”). Summarize utility consumption in a schedule that addresses the following (as applicable): **G**

- | | | |
|----|----------------|--|
| 1) | Electricity | KVA |
| 2) | Steam | lbs/hr |
| 3) | Chilled water | gpm and Tons |
| 4) | Domestic water | gpm |
| 5) | Fire Flow | gpm |
| 6) | Irrigation | gpm |
| 7) | Sanitary | gpm |
| 8) | Storm | Total impervious Area, sq.ft. or acres |

5. *Electrical Systems:* Provide narrative discussion of the design, including basic assumptions and points of interconnection with the existing electrical systems. Submit preliminary load calculations and for both normal and emergency power distribution system. Explain the impact of the new construction to the existing distribution system. Include current demand load and projected load of new construction. Describe work phasing plan. **G**

- a. *Drawings:* As applicable, provide the following at appropriate scales:

- 1) *Floor Plans:* Indicate location and sizes of electrical and emergency equipment and include room titles and area functions. Provide electrical plans at the same scale as the architectural floor plans. Provide separate distribution plans for lighting, power, and telecommunication layouts. **G**
- 2) *Electrical Rooms:* Provide minimum 1/8" scale plans of all electrical rooms indicating the adequacy of the new electrical equipment layout. **G**
- 3) *Single-Line Diagrams:* Submit a clear elementary single-line diagram of the proposed electrical system (normal and emergency). Include in the diagram low voltage panelboards, branch circuit panels and representative methods of feeding 277/480 volt, (if required) and 120/208 volt normal and emergency panels. Include preliminary design of proposed lighting and lighting controls, dimmers, location of cove lighting, etc. Indicate proposed special purpose power circuits, such as isolated computer power. Describe the methods and assumptions used for lighting foot candle level calculations. **G**
- 4) *Materials:* Provide lighting fixture product data (cuts), and cuts of any other major electrical components which will require AOC approval. **G**

- b. *Calculations:* Provide preliminary load calculations for both normal, emergency, and any special power distribution systems. Break calculations down into lighting, receptacles and power. Include current demand load and projected load of new construction. For alterations and additions, indicate if the existing panels meet the new loads and available short circuit rating. **G**

6. **Fire Protection:** Provide narrative discussion of occupancy classifications, ratings of structural components, classification of interior finishes, and location of fire-rated walls and partitions. Identify code sections used and review the building for compliance with life safety codes and discuss the design's impact on security requirements. Highlight any requirements for use of code equivalencies or exceptions. Highlight any requirements for use of code equivalencies or exceptions. Provide egress information with tabular listing of number and type of each exit, loads at each exit, and travel distances with path widths and capacities noted. Indicate planned configuration of sprinkler system, types of sprinklers to be used and the minimum required residual pressure required for each type, and concepts of fire notification and alarming. Provide summary of hydrant flow test data for fire water connection that is no more than 1 year old. **G**
 - a. **Fire Protection Drawings:** Provide fire protection plans for each floor, at same the scale as the architectural floor plans, that show fire alarm zones, sprinkler zones and associated occupancy hazard, smoke zones, equipment spaces for fire protection systems, standpipe and locations, sprinkler main sizes, zone valves, and flow switches, locations and ratings of fire walls and smoke barriers. Provide cover sheet listing codes employed, edition, and major sections. **G**
 - b. **Calculations:** Provide NFPA occupant loads and area of each space, full egress calculations, sprinkler hydraulic calculations with pressure losses associated with all components and applied to most distant sprinkler, and notation of software used. **G**
 - c. **New buildings or New fire service:** Contact the District of Columbia Water and Sanitation Department (or other jurisdictions as appropriate) to coordinate the requirement for the new service. **G**
7. **Security Systems:** Requirements for security systems will be forwarded to the Associate A/E on a case-by-case basis. **G**
- D. **Outline Specifications Submission:** Identify principle materials, finishes, and building systems to be used. At this stage, brand names may be utilized to describe components in the interest of brevity. **G**
- E. **Cost Estimates Submission:** Prepare cost estimates in accordance with ASTM E-1804, *Standard Practice for Performing and Reporting Cost Analysis During the Design Phase of a Project*, Paragraph 6.4, *Design Development Phase Estimate*. Prepare the design estimate using Unifomat II, Level 3 (ASTM E-1557) based on design phase floor plans, outline specifications for principle materials, finishes, and building systems, and typical unit costs for structural, mechanical, and electrical systems. Include a design contingency at this phase to account for the preliminary nature of the design. Provide allowances for materials/systems not yet defined. **G**
- F. **Design Review Deliverables:** When the documents are approved for submission, the Associate A/E shall provide the AOC with the full sets of documents for distribution to

reviewing offices. Allow 2 work days for internal distribution by AOC staff prior to the required review conference.

1. Provide a minimum of 5 sets (or the number enumerated in the Professional Services Contract or Task Order) of unmounted drawings reduced to half size plots. **G**
 2. Provide one set of schematic drawings mounted on foam board. **G**
 3. Provide 5 sets (or the number enumerated in the Professional Services Contract or Task Order) of calculations, specifications, and cost estimates bound into 8-1/2" x 11" brochures. **G**
 4. Deliver required databases on standard *MS Windows NT* or *XP* formatted 3-1/2" floppy disks, CD-ROM, or ZIP disks. **G**
- G. **Kick-Off Review Conference:** The Associate A/E shall conduct a formal, technical "overview" presentation to the AOC Project Team following the AOC document distribution period. **G**
- H. **AOC Discipline Review Conference:** The Associate A/E shall allow a minimum of 5 calendar days for AOC review following the Kick-Off review conference and then meet with individual design discipline teams to fully discuss each discipline's work. **G**
- I. **Wrap-Up Review Conference:** A minimum of 5 calendar days after the Discipline Review Conference, the Associate A/E shall meet with the AOC to discuss and clarify preliminary comments prior to comment consolidation and delivery to the Associate A/E. Review comments will be forwarded to the Associate A/E using the standard AOC spreadsheet format. The Associate A/E shall respond to comments within 5 calendar days. Resolve all comments prior to making application for payment for each phase. **G**
- J. **Back-Check:** Resolve and document responses to all agency comments. Obtain approval to responses prior to proceeding with the next phase. Incorporate required revisions to drawing files prior to proceeding to next phase to ensure that all participants are working from the same coordinated design. Submit revised record set to the AOC Project Manager. **G**
- K. **Formal Presentations & "On-Board Reviews":** The Associate A/E shall prepare a formal presentation of the Design to both the Client, required Congressional oversight committees, and such public presentations as may be identified by the AOC. Such presentations shall include large scale mounted plots of architectural floor plans that clearly explain the design response to Building Program. As appropriate, supplement the mounted plans with diagrammatic images and space/area charts or tables that summarize adherence to requirements. The Associate A/E should plan on having the lead design professional from each major discipline in attendance at these presentations to answer questions. If provided in the Professional Services Contract or Task Order, provide a mass model to explain the project's relationship to surrounding areas and buildings. **G**
1. The Associate A/E shall prepare for 2 formal presentations.

4m.4 CONSTRUCTION DOCUMENTS PHASE

- A. **Construction Documents - Rolling Reviews:** Informal reviews and progress checks will be held throughout the development of the construction documents through the simple expedient of having sample “checkset” plotted for AOC review. At completion of this phase, submit a complete set of construction documents for final review and bidding. Include review comments and responses from the preceding phase.
1. **Mid-Point Review:** For purposes of scheduling and preparation of the Associate A/E’s fee proposal, plan for one check review at the consultant’s office with the AOC Project Manager and appropriate AOC Task Leaders. This mid-point review may be conducted using standard check plots or “yellow-line” correction sets. The intent of this review is to confirm progress while minimizing the expenditure of time by Team members. **G**
- B. **Construction Documents - Drawings:** Associate A/Es are encouraged to use AOC 22" x 34" title blocks (where applicable) with the goal of printing half-size final documents. Where project complexity warrants, prepare conventional documents. **G**
- C. **Final Documents - Pre-Submission Procedures:** Approximately 3 weeks prior to the Associate A/E’s production of the final document review sets, the Project Manager shall meet with the Associate A/E to review one complete set of documents and verify that the intended submittal possesses the information required for the AOC’s review process. **G**
1. **Project Specifications:** Submit for review and approval drafts using “striked-out” masters or annotated copies of office masters that clearly show data retained and deleted. Eliminate any references to proprietary brand names unless the products have been previously approved by the AOC Project Manager. **G**
2. **Cost Estimates Submission:** Submit for review a draft construction cost estimate prepared in accordance with ASTM E-1804, *Standard Practice for Performing and Reporting Cost Analysis During the Design Phase of a Project*, Paragraph 6.5, *Construction Document Phase Estimate*. Prepare the estimate using Unifomat II, Level 4 (ASTM E-1557) based on 100% construction document floor plans, specifications for all materials, finishes, and building, mechanical, electrical, fire protection, and security systems, as applicable. Include detail reports with full crew resource loading. Do not include any design contingency. Perform value engineering analysis as required to ensure bidding within funding limitations and to assist in definition of any necessary Bid Options. **G**
- D. **Final Engineering Calculations:** Provide final calculations for major systems and necessary material data to support all equipment, materials, and systems used in the final construction documents. **G**
- E. **Final Project Specifications:** Provide all sections, with review comments fully resolved, printed in final format complete with applicable project number and title on every page. **G**

1. **Construction Branch:** Projects that have been confirmed for Construction Branch construction may utilize “short-form” specification formats for the Technical Section that provide material listings but do not include fully developed Part 1, General, or Part 3, Execution portions.
 2. **SOC Contracts:** Provide complete Technical Sections. Assist the AOC in the preparation of Division 1, General Requirements (Short Form).
 3. **Invitation for Bids:** Projects that will be constructed by a single trade or a very limited number of trades will be identified by the AOC as requiring preparation for open public bidding. Examples of this condition include elevator modernization contracts, roof replacements, paving and sidewalk contracts, etc.
- F. **Final Cost Estimates Submission:** Update the draft submitted above and incorporate AOC review comments. Final cost estimate submissions shall provide an estimate for each base bid, option (alternate), and unit price. **G**
- G. **Design Review Deliverables:** When the documents are approved for submission, the Associate A/E shall provide the AOC with the full sets of documents for distribution to reviewing offices. Allow 2 work days for internal distribution by AOC staff prior to the required review conference.
1. Provide a minimum of 5 sets (or the number enumerated in the Professional Services Contract or Task Order) of unmounted drawings reduced to half size plots. **G**
 2. Provide 5 sets (or the number enumerated in the Professional Services Contract or Task Order) of calculations, specifications, and cost estimates bound into 8-1/2" x 11" brochures. **G**
 3. Deliver required spreadsheets, calculations, specifications, etc. on standard 3-1/2" *Windows NT* or *XP* formatted floppy disks or CD-ROM. **G**
- H. **Kick-Off Review Conference:** The Associate A/E shall conduct a formal, technical “overview” presentation to the AOC Project Team following the AOC document distribution period. **G**
- I. **AOC Discipline Review Conference:** The Associate A/E shall allow a minimum of 5 calendar days for AOC review following the Kick-Off review conference and then meet with individual design discipline teams to fully discuss each discipline’s work. **G**
- J. **Wrap-Up Review Conference:** A minimum of 5 calendar days after the Discipline Review Conference, the Associate A/E shall meet with the AOC to discuss and clarify preliminary comments prior to comment consolidation and delivery to the Associate A/E. Review comments will be forwarded to the Associate A/E using the standard AOC spreadsheet format. The Associate A/E shall respond to comments within 5 calendar days. **G**

4m.5 CONSTRUCTION DOCUMENTS - BACKCHECK SUBMISSION

- A. **Construction Documents - Final:** Correct 100% construction documents to incorporate revisions to comply with final AOC review comments. **G**

- B. **Final Engineering Calculations:** Provide final calculations for major systems and necessary material data to support all equipment, materials, and systems used in the final construction documents. **G**
- C. **Project Specifications:** Provide 100% of the applicable sections complete, printed in final format complete with applicable project number and title on every page. **G**
- D. **Cost Estimates Submission:** Provide corrected 100% construction documents cost estimates to incorporate revisions to comply with final AOC review comments. **G**
- E. **Documents Review and Final Deliverables:** Submit final deliverables:
 - 1. Provide a one complete set of polyester reproducible, plotted at full-size, ready for final reproduction and bidding and a minimum of 8 bound sets (or the number enumerated in the Professional Services Contract or Task Order) of drawings. **G**
 - 2. Provide 8 sets (or the number enumerated in the Professional Services Contract or Task Order) of calculations, and cost estimates bound into 8-1/2" x 11" brochures. **G**
 - 3. Provide one camera-ready, unbound copy original of the Project Manual and 5 bound copies. **G**
 - 4. Deliver required spreadsheets on standard *MS Windows NT* or *XP* formatted 3-1/2" floppy disks or CD-ROM. Deliver other required deliverables in accordance with applicable Parts of this *A/E Design Manual*. **G**

4m.6 **PROCUREMENT PHASE (AS APPLICABLE)**

- A. **General:** These projects will generally be executed under Construction Branch or SOC contracts. Conventional bidding activities, as such, will normally not be required. The AOC will work with Construction Branch or SOC contractors to negotiate the construction contract. However, the Associate A/E shall respond to Requests for Interpretation and provide responses to the AOC Project Manager for inclusion in any Addenda.
- B. **Preparation of Addenda:** All addenda which are required to clarify the bidding documents, respond to RFIs, accomplish revisions, accept or reject substitutions, and correct errors shall be prepared by the Associate A/E and forwarded to the AOC Project Manager for approval and subsequent distribution by the AOC. Prepare addenda in formats similar to those used in the Project Manual, listed in the order of the Project Manual and drawings, addenda numbered sequentially and dated. Do not include Bidder's Meeting minutes in addenda. Issues forwarded to the Associate A/E by bidders shall be reviewed, determinations made, and draft text forwarded to the AOC Project Manager within 5 calendar days of the bidder's addenda request for inclusion in the Addenda. **G**

4m.7 CONSTRUCTION PHASE (AS APPLICABLE)

- A. General:** This section addresses jointly shared construction administration responsibilities provided for Medium Projects - led principally by the AOC Project Manager and the AOC Construction Manager. These responsibilities required of the Associate A/E may differ from those employed in the private sector or with other Federal agencies. They differ from some other agencies in that the AOC has a professional staff and construction management expertise.
1. **Professional Services Contract:** Services in this section are dependent on an option for Construction Administration being exercised in the Professional Services Contract or Task Order.
 2. **Procurement Methods:** Medium projects are usually procured via Construction Branch or SOC. As discussed above, Medium Projects may be constructed through the use of Invitations for Bid (IFB). The provisions of this section are prefaced on those contract methods. Because of the contract methods utilized for this class of project, the AOC will assume greater Construction Administration responsibilities than those included in traditional private sector work.
 3. **Document Annotation:** The Associate A/E shall update all construction documents with appropriate annotation to reflect addenda clarifications and modifications issued during the procurement period and to reflect any Solicitation Options exercised by the AOC.
- B. Mobilization/Project Startup:**
1. **Pre-Construction Meeting:** Associate A/E's Project Manager is required to attend. The AOC will conduct the meeting and take and distribute minutes. Agenda items include:
 - a. **The Team:** Introduction of team members from each firm, circulation and verification of address/telephone roster. Identification of roles and responsibilities.
 - b. **Required Submittals:** Evidence of proper insurance, bonding, etc., required prior to Contractor mobilizing on-site.
 - c. **Required Processes:** Procedures for submittals, RFI processing, payment procedures, modifications, etc.
 - d. **Site Restrictions:** Limits on construction compounds/staging areas, Police access requirements, temporary facilities, etc.
 - e. **Quality Assurance Procedures:** List required submittal of plan, required personnel, etc.
 2. **Construction Schedule:** The Contractor shall submit and request approval of the Construction Schedule prior to commencing work on-site.
- C. Projects Controls and Decision Expediting:**
1. **Request for Interpretation (RFI):** The AOC Construction Manager is responsible for processing and resolving RFIs. The AOC Construction Manager will consult with the Associate A/E and the AOC Project Manager for interpretation of all RFIs. The AOC

Master specification sections for Division One, *General Requirements*, constrain the Contractor to pre-process all RFIs prior to requesting interpretation from the Architect.

2. **Processing of Submittals:** The AOC Construction Manager shall process, forward to the Associate A/E for review and annotation/comment all submissions of product data, shop drawings, calculations, coordination drawings, samples, and mock-ups for compliance with Contract Documents. The Associate A/E will return annotated submittals to the AOC for final approval. The AOC Construction Manager will consult with the AOC Project Manager for interpretation or clarification of issues involving submittals.
3. **Certifications and Test Reports:** The AOC Construction Manager will review and approve all Contractor certifications and test reports. The AOC Construction Manager will consult with the AOC Project Manager, who may also consult the Associate A/E, for interpretation or clarification of issues Certifications and Test Reports.
4. **Field Meetings:** Associate A/E attendance of weekly or bi-weekly field meetings is required.
5. **Field Observation:** The Associate A/E may visit the Project and conduct on-site observations of the Work after coordination and upon approval of the AOC.
6. **Construction Modifications (Change Orders):** The AOC Construction Manager will process and recommend for approval by the AOC Project Manager all Change Order requests. The Change request shall be analyzed for conformance with design intent, consistency, fair cost, and the affect on project schedule. Final acceptance of all Change Requests resides with the AOC. Requests for “approved equals” will not be accepted as the basis for change order requests.
7. **Requests for Payment:** The Associate A/E shall review all Contractor Requests for Payment and forward same to the AOC Construction Manager for final processing by the agency.

D. Project Closeout:

1. **FFE Coordination:** Coordination of Government furnished furniture, fixtures, and equipment will be coordinated by the AOC Construction Manager and the applicable AOC Superintendent’s office.
2. **Punch Lists:** The Associate A/E will prepare the project “punch-list” and recommend to the AOC completion of required elements on the list.
3. **Closeout Submittals:** Ensure that training of Government employees has been conducted, Operation and Maintenance Manuals are distributed, and maintenance schedules and methods are clearly presented for implementation by the Government. Maintenance schedules and methods shall be addressed specifically to the equipment as employed in the project.
4. **Equipment Startup (Commissioning):** *[Future]*

4m.8 CONSULTANT PROJECT CLOSEOUT

- A. **General:** As part of final project closeout collect, organize, and transmit to the AOC any revisions to specifications, construction modifications, Requests for Interpretation; etc. that have not been previously delivered to the AOC.
- B. **As-Built Documentation:** If the Professional Services Contract or Task Order requires Associate A/E preparation of “as-built” CAD files incorporating all field revisions and construction modifications update the appropriate construction drawings and forward electronic copies to the AOC. If the Professional Services Contract or Task Order requires review and approval of “as-built” CAD data prepared by others, complete that review and transmit findings to the AOC.
- C. **Final Payment to Associate A/E:** Following delivery and AOC approval of Consultant Closeout documentation, prepare and submit request for final payment.

End of Part 4m

PART 4I - DESIGN REQUIREMENTS FOR LARGE PROJECTS

-
- 4I.1 INTRODUCTION**
 - 4I.2 PROJECT STARTUP**
 - 4I.3 BUILDING PROGRAM**
 - 4I.4 SCHEMATIC DESIGN**
 - 4I.5 DESIGN DEVELOPMENT**
 - 4I.6 CONSTRUCTION DOCUMENTS - 50% PROGRESS SUBMISSION**
 - 4I.7 CONSTRUCTION DOCUMENTS - 100% FINAL SUBMISSION**
 - 4I.8 CONSTRUCTION DOCUMENTS - 100% BACKCHECK SUBMISSION**
 - 4I.9 PROCUREMENT PHASE**
 - 4I.10 CONSTRUCTION ADMINISTRATION PHASE**
 - 4I.11 CONSULTANT PROJECT CLOSEOUT**

PART 4I - DESIGN REQUIREMENTS FOR LARGE PROJECTS

4I.1 INTRODUCTION

- A. **General:** Design phases for Large Projects shall conform to the definitions stated within the American Institute of Architects *Handbook* (large projects are defined in Part 2). During the planning period the Associate A/E is required to make submittals of the Phases of the Design Process that correspond with the Professional Services Contract detailing the required Phases and stages of those phases for which deliverables are required:
1. Programming Phase (as required by the Professional Services Contract).
 2. Schematic Phase.
 3. Design Development Phase.
 4. Construction Documents Phase (with intermediate stages as defined below).
 5. Procurement (Bid) Phase.
 6. Construction Administration Phase (as required by the Professional Services Contract).
- B. **Level of Detail:** All projects shall be designed and construction documents prepared as if the resulting project is to be formally bid through either an Invitation for Bids or Request for Proposals. The consultant is cautioned that due to government restrictions on the use of brand names, federal construction documents typically require higher levels of detailing and specification than do projects for commercial work of comparable quality.
- C. **Pre-Submittal Reviews:** At the completion of each design phase and prior to printing of review sets, the Associate A/E shall meet *informally* with the AOC Project Manager to verify that available drawings and documents meet submittal expectations for the design phase at hand and to develop a list of documents for reproduction and submission for review. Where possible, this meeting will be held at the Associate A/E's office and at such time as to permit document reproduction without infringing on the AOC review period.
- D. **Incorporation of Review Comments:** All review comments shall be incorporated into work subsequent to each submittal and *prior to commencement of the next phase*. All comments shall be responded to in writing to clearly state the action the Associate A/E will take in response to each comment. If the Associate A/E takes exception to a review comment, the issue shall be clearly presented so that the issue may be resolved by the AOC. Responses to AOC review comments shall be entered into the AOC-provided computer spreadsheets to enable consistent tracking of related comments throughout the life of the project. Clarify "Will Comply" responses with actions to be undertaken. Resolve all comments prior to making application for payment for each phase.(See Appendix 4A).
1. **Backcheck Sets:** Submission of backcheck sets verifying incorporation of AOC comments shall be limited to sheets or specification sections affected by those comments and to a

single set of same for review by the AOC Project Manager. The 100% construction documents backcheck submission shall be a complete construction documents set.

41.2 PROJECT STARTUP:

- A. **Pre-Design Kick-Off Meeting:** As required by Part 3 and prior to commencement of the Design phase, the Associate A/E shall meet with the AOC Project Manager and review the Building Program, the Schedule, the Budget, the Team and administration responsibilities. **G**
- B. **Consultant Approach:** The Associate A/E shall examine the *Building Program*, the AOC Design Standards, and prepare a Project Execution Plan that summarizes the firm's approach to executing the work, identifies input required from major stakeholders, and enumerates the major design standards to be used and how they will be applied to the Project. **G**
- C. **Project Schedule:** Prepare a proposed project schedule and resource plan for the Project incorporating all required Associate A/E and AOC resources. The proposed Project Schedule shall conform to the delivery requirements stated in the Professional Services Contract. Include each design phase, each required review period and approval, procurement (bidding & award) phase, full construction phases, and commissioning activities. The Associate A/E shall review the proposed Project Schedule with the AOC Project Manager to ensure that all work can be accomplished in accordance with available resources and within required constraints. A standard Gant chart (bar-chart) is an acceptable format for presenting the activity time line. **G**
 - 1. *Review Schedule:* Coordinate review periods with the AOC Master Design Review Schedule maintained by the AOC *Project Information System*. Ascertain open time slots prior to finalizing project delivery schedules.

41.3 BUILDING PROGRAM

- A. **Required Prior to Design:** Prior to commencement of the Schematic Design phase, the formal *Building Program*, based on the Initial Project Statement and approved by the Client, will be prepared. The *Building Program* will be developed provided to the Associate A/E, or:
 - 1. **Associate A/E Developed Programs:** If specified within the Professional Services Contract, the Associate A/E shall prepare a formal *Building Program* in conformance with Part 2, Project Programming. Note that programming services are recognized as Additional Services beyond the scope of the Basic Services contained within the standard Associate A/E Professional Services Contract. **G**
 - 2. **Site-Analysis Services:** If required by the Professional Services Contract, the Associate A/E shall analyze the existing site for adequacy utility service, fire hydrant flow tests performed within the past 5 years, presence of existing underground obstructions or hazards, topographic features and drainage, relationship of site access transportation sources (both private and public), relationship of site features to surrounding buildings and natural features, and micro climatological systems. **G**
 - 3. **Existing Conditions Documentation:** If required by the Professional Services Contract, the Associate A/E shall survey the existing facility, either field measure existing rooms

and spaces and create drawings or validate AOC provided drawings of rooms and spaces. Document critical discrepancies and modify the drawings to accurately reflect existing conditions, and analyze existing structural, mechanical, electrical, and life safety systems and document each to the extent required for execution of the Project. **G**

4. ***Basis of Design Document:*** Prior to commencing work, provide a Basis of Design outline that represents the Associate A/E's understanding of Program requirements, summarizing by system features and components to be provided in the submitted design. **G**

B. **Preliminary Code Analysis:** The Associate A/E is responsible for compliance of the design with Code requirements. If the Professional Service Contract requires the services of a Code Consultant, coordinate that consultant's findings with all members of the design team. For all projects, at a minimum, the Preliminary Analysis shall define the following: **G**

1. Applicable Code and Edition, as identified by the AOC, applied to the analysis,
2. Use Group Classification (s) for the facility and major parts thereof,
3. Proposed or existing type of Construction Classification,
4. Accessibility regulations to be applied.
5. Mechanical code evaluation to address how ventilation and exhaust requirements will be achieved.
6. Electrical code evaluation to address how lighting levels and emergency power requirements will be achieved. How electrical equipment installation requirements will be addressed.
7. Life safety code evaluation to address egress, fire alarm and fire suppression systems and how they will be addressed. Include an evaluation of code mandated smoke control systems.
8. Equivalency and Options proposals to resolve code issues discerned while maintaining historic fabric of the facility.
9. Maintenance of Egress: Provide plans addressing maintenance of emergency egress around any construction site that impacts building egress paths. Provide a table of signage revisions and tabulated corrected egress loading per route.
10. ***Preliminary HazMat Assessment:*** Conduct field surveys as required to supplement any existing conditions documents forwarded by the AOC Project Manager. **G**

- a. ***Hazardous Material Identification:*** Review existing asbestos and lead test results provided by the AOC. Perform additional testing for lead-based paint and asbestos-containing materials as necessary to determine the extent of hazardous materials to be encountered during the construction of the project. A certified inspector must be used to obtain the required number of bulk asbestos and/or lead-based paint samples in the areas affected by the project, and submit the samples to a certified laboratory for analysis. The asbestos samples must be analyzed using either polarized light microscopy (PLM) with dispersion staining (EPA Method 600/R93-116) or transmission electron microscopy (TEM) for non-friable organically bound bulk samples (NY ELAP Method 198.4). Provide a report that reflects both the reliance on past testing and the results of any additional analysis, and include quantities of the hazardous materials found.

- b. *Waste Stream Samples:* To address EPA regulatory concerns, take a representative sample of the waste stream to be generated and perform Toxicity Characteristic Leaching Procedure (TCLP) testing (EPA Method 1311) to determine if the lead/heavy metals in the wastes should be managed and disposed of as hazardous waste; or determine through appropriate calculations that the lead/heavy metal content cannot exceed the TCLP limit for hazardous waste.
- c. *Abatement:* Incorporate appropriate abatement, monitoring, and disposal procedures into the design documents.
- d. *Hidden Hazards:* Incorporate standard language related to hidden hazards (see AOC Division One).

41.4 SCHEMATIC DESIGN

- A. **Schematic Design:** During this phase define the total project scope. Describe the project principally in two dimensional configurations against the requirements contained within the *Building Program*. The presented schematic design should demonstrate a range of design alternatives investigated for each discipline with each developed to an extent to clearly demonstrate why the system or design presented was chosen. The resulting scheme shall have areas, spaces, and relationships confirmed against *Building Program* requirements and all deviations identified and reconciled.
- B. **Pre-Submission Procedures:** Prior to production of the review sets, the AOC Project Manager shall meet with the Associate A/E to review one complete set of documents and verify that the intended submittal possesses the information required for the AOC's review process. **G**
- C. **Schematic Design Submissions:** The Schematic design submission shall contain the following:
 - 1. **Design Commentary:** Provide narrative descriptions of various features and a listing of any differences between the submitted design and the *Building Program*. Summarize the features of the building envelope, major structural systems, principal interior finishes, historic considerations, mechanical systems, electrical systems, conveying systems, fire alarm/life safety systems, security and telecommunication systems. Discuss circulation and egress plans for all categories of occupant. Detail unique features requiring specialized definition or proprietary or time critical solution that could impact project delivery. Clearly identify government furnished furniture, fixtures and equipment. **G**
 - a. **Code Analysis:** Update code analysis, listing compliance required occupancy, life safety, fire resistance, and structural adequacy. **G**
 - b. **Options:** Develop list of design options to ensure that the project may be kept within budget limitations. **G**
 - 2. **Space Studies:** Tabulations contained in a standard spreadsheet format containing at a minimum the following data or database fields: **G**
 - a. Title Block

- b. Project Name
 - c. AOC Project Number
 - d. Gross Project Square feet
 - e. Program Space Name
 - f. Program Net Assignable Square Footage for each Space.
 - g. Schematic Space Name.
 - h. Schematic Net Assignable Square Footage for each Space.
 - i. Variance between Program and Schematic assignable areas.
3. **Site Studies:** Provide a narrative describing the site, the planned access to the building, the relationship to surrounding buildings, future expansion potential, the availability of utilities and services, the interaction with existing pedestrian and vehicular transportation systems, and any restrictions on use of the site. For projects affecting Congressional garages or surface parking, summarize the impact on space count, suggested alternative locations, and length of time that the parking will be affected. **G**
- a. **Drawings:** Provide site plans indicating site boundaries, limits of improvements, setbacks and easements, existing buildings and structures to be removed or retained, adjacent buildings that could impact the project, general topography and vegetation, and predominate drainage routes. Indicate extent of pedestrian/vehicular circulation and parking, and access routes to public transportation. Identify all existing on-site utility services and off-site utility services, including fire protection services. **G**
 - b. **Calculations:** Drainage and run-off the building will impact, parking counts. **G**
4. **Architecture:** Provide narrative discussion by system to address building massing, circulation and access to major spaces, justification for major materials and finishes to be used, planned methods/systems for exterior maintenance, and a list of options being proposed to control scope/cost. Address incorporation of all Government-provided furniture, fixtures, and equipment. **G**
- a. **Drawings:** As applicable to the project, provide the following at appropriate scales:
 - 1) **Floor Plans:** Single line floor plans, showing departmental areas and agencies, work areas, corridors, entrances, vertical transportation, and identifying each room or space. Provide overall dimensions; indicate how major mechanical/electrical components may be removed/replaced. **G**
 - 2) **Elevations:** For major building faces showing building massing, shadow lines, materials, fenestration, roof slopes, and relation to adjoining buildings. **G**
 - 3) **Building Sections:** Transverse or longitudinal building section showing floor-to-floor relationships, construction, and roof profiles. **G**
 - b. **Calculations:** Provide preliminary plumbing fixture counts, egress populations, and vertical transportation studies. **G**

5. **Structural Systems:** Provide a narrative discussion of conceptual framing and foundation system with comparison of alternate systems considered and reasons for rejection of each.
 - a. *Drawings:* Provide drawings indicating planned framing systems with bay sizes, column locations, and expansion joints. **G**
 - b. *Calculations:* Identify all live, dead, seismic and wind design loads. **G**
6. **Mechanical Systems:** Provide a narrative discussion of the HVAC system general features, configuration, rationale for selection, and how it integrates with architectural building systems. For new facilities, explain Project interfaces with existing chilled water and steam sources, city water/sewer connections, and electrical utilities. Verify reliability/capacity of existing infrastructure. Include block loads based on area and use group. **G**
 - a. *Plan Drawings:* Show equipment spaces for mechanical equipment, single-line distribution diagrams, and connection points to existing supply sources. **G**
 - b. *Plumbing:* Describe proposed special features of system and provide dimensioned sketch of major service entry and waste routes, distribution scheme. **G**
 - c. *Calculations:* Provide gross heating/cooling loads. **G**
7. **Electrical Systems:** Provide narrative discussion of the electrical design approach. Describe the proposed electrical system (normal and emergency) and anticipated loads. The narrative shall include the advantages/disadvantages to support the consultant's recommendations. Provide the following: **G**
 - a. *Plan drawings:* Show the locations of new and existing electrical and telephone rooms/closets, security systems, and other spaces to meet the project requirements. Coordinate space requirements with architectural plans. **G**
 - b. *Riser Diagrams:* Single-line riser/distribution diagrams for standard/emergency system; show locations of telecommunication and security equipment closets. **G**
 - c. *Utility Capacity:* For new buildings with new electrical service, the consultant shall contact the local utility company as necessary and indicate the type of service available in the schematic design report. **G**
 - d. *Special Systems:* Describe in narrative form requirements for such items as conveying systems, UPS for file server, fire alarm, fire pumps, security, telephone and other systems. **G**
 - e. *Renovation & Alteration Narrative:* Provide a statement of impact of the new construction to the existing distribution system, include existing loads and projected loads. Base submission on a survey of existing conditions, including an evaluation of whether the existing services meet all code and safety requirements and have adequate capacity to serve all proposed new loads. Indicate if existing electrical or telecom rooms have sufficient room to meet the project requirements or if new closet spaces or rooms are required. **G**

- 1) Describe methods to connect new loads/ and any upgrades required with normal and emergency systems, fire alarm systems, security, and telecommunication systems. **G**
 - 2) Propose in narrative form recommendations to improve or modify the existing electrical system for the project (for example, remove all tapped feeders and serve each panel separately from main distribution panel). **G**
 - 3) Describe in narrative form all phasing of the work, temporary power requirements, and any electrical services required to maintain operation of the renovated areas. Indicate any existing equipment to remain in service which is being served from the renovated area. **G**
 - f. *Calculations:* Provide unit load calculations for the project to verify utility service requirements. **G**
 8. **Fire Protection:** Provide narrative discussion of the fire alarm and extinguishing systems planned for the facility. Identify occupancy classification (s), height and area calculations, types of construction, and fire suppression requirements. Provide summary of hydrant flow test data for fire water connection that is no more than 1 year old.
 - a. *Drawings:* Identify major routes of egress and any required areas of refuge. Show sources of fire protection water supplies, fire hydrant locations, and equipment spaces for fire protection systems. **G**
 - b. *New buildings or New fire service:* Contact the District of Columbia Water and Sanitation Department (or other jurisdictions as appropriate) to coordinate the requirement for the new service. **G**
 9. **Security Systems:** Requirements for security systems will be forwarded to the Associate A/E on a case-by-case basis. **G**
 10. **Food Service Systems:** Describe in narrative format any plans for food service areas and define applicable codes and standards to be observed. **G**
 11. **Outline Specifications Submission:** Identify principle materials, finishes, and building systems to be used. At this stage, brand names may be utilized to describe components in the interest of saving time. Format outline specification in either MasterFormat or Unifomat. Listing of proposed specification section titles absent product/material descriptions will not be accepted. See Appendix 6a. **G**
 12. **Cost Estimates Submission:** Prepare cost estimates in accordance with ASTM E-1804, *Standard Practice for Performing and Reporting Cost Analysis During the Design Phase of a Project*, Paragraph 6.3, *Schematic Design Phase Estimate*. Prepare the Schematic estimate using Unifomat II, Level 3 (ASTM E-1557) based on schematic floor plans, outline specifications for principle materials, finishes, and building systems, and typical unit costs for structural, mechanical, and electrical systems. Include a design contingency of 20% to 25% at this phase to account for the preliminary nature of the design. Provide allowances for materials or systems not yet defined. (See Appendix 8b). **G**
- D. **Design Review Deliverables:** When documents are approved for submission, provide the AOC with the full sets of documents for distribution to reviewing offices. Allow a minimum of 3

work days for internal distribution by AOC staff prior to the required Kick-Off review conference.

1. Provide a minimum of eight (8) sets (or the number enumerated in the Professional Services Contract) of unmounted drawings reduced to half size plots. **G**
 2. Provide one set of full-size schematic architectural, mechanical, electrical and plumbing drawings mounted on foam board. **G**
 3. Provide eight (8) sets (or the number enumerated in the Professional Services Contract) sets of calculations, specifications, and cost estimates bound into 8-1/2" x 11" brochures. **G**
 4. Deliver required databases on standard 3-1/2" *MS Windows NT* or *XP* formatted floppy, CD-ROM, or ZIP disks. **G**
- E. **Kick-Off Review Conference:** The Associate A/E shall conduct a formal, technical presentation to the AOC Project Team following the initial 3-day AOC document distribution period. **G**
- F. **AOC Discipline Review Conference:** The Associate A/E shall allow a minimum of 7 calendar days for AOC review following the Kick-Off review conference and then meet with individual design discipline teams to fully discuss each discipline's work. **G**
- G. **Wrap-Up Review Conference:** A minimum of 7 calendar days after the Discipline Review Conference, the Associate A/E shall meet with the AOC to discuss and clarify preliminary comments prior to comment consolidation and delivery to the Associate A/E. Review comments will be forwarded to the Associate A/E using the standard AOC spreadsheet format. The Associate A/E shall respond to comments within one week. **G**
- H. **Formal Presentations & "On-Board" Reviews:** The Associate A/E shall prepare a formal presentation of the Schematic Design to both the Client and required Congressional or Judicial oversight committees. Such presentations shall include large scale mounted plots of architectural floor plans that clearly explain the design response to *Building Program*, the compliance to the Master Project Management Plan, and evolving site logistics/constructability issues. As appropriate, supplement the mounted plans with diagrammatic images and space/area charts or tables that summarize adherence to requirements. The Associate A/E should plan on having the lead design professional from each major discipline in attendance at these presentations to answer questions. The Associate A/E shall prepare for 2 formal presentations. **G**
1. **"Rendering:"** Provide a three-dimensional color rendering or computer model of the major exterior views of the project, including site adjacencies. **G**
2. **Mass Model:** If provided in the Professional Services Contract, provide a basic massing model to explain the project's relationship to surrounding areas and buildings. **G**

41.5 DESIGN DEVELOPMENT

- A. **Design Development:** Completely define the project design during this phase. Refine schematic designs to incorporate revisions to meet AOC comments provided during the Schematic review. Design **stops** at the end of this phase. Project conditions unresolved during design development are difficult to coordinate during production of construction documents.
1. ***Bid or Proposal Options:*** Identify potential options at this phase to allow for approval by the AOC and for proper incorporation/coordination in the construction documents. **G**
 2. ***Proprietary Items:*** If proprietary items will be required within the project design, this submission should disclose those items, provide product data, list their salient characteristics and the reasons why they must be used, and recommended methods for obtaining substitutes should they not be available. The design should not proceed with a concept if that concept can hold the project “hostage” to its availability, either in the new facility or in its subsequent maintenance and replacement. **G**
- B. **Pre-Submission Procedures:** Prior to production of the review sets, the AOC Project Manager shall meet with the Associate A/E to review one complete set of documents and verify that the intended submittal possesses the information required for the AOC’s review process. **G**
- C. **Design Development Submission:** The Design Development submission shall contain the following:
1. ***Design Commentary:*** Provide narrative discussion of various features, by system, and a listing of any differences (or exceptions) between the *Building Program*, the Schematic Phase, and the Design Development Phase. Provide a complete Code Analysis at this Phase, listing compliance required occupancy, life safety, fire resistance, and structural adequacy. **G**
 2. ***Space Studies:*** Update area tabulations contained in the spreadsheet developed during the Schematic Phase containing at a minimum the following data fields: **G**
 - a-f. Fields as listed in the Schematic Phase Table.
 - g. Design Development Space Name.
 - h. Design Development Net Assignable Square Footage for each Space.
 - i. Variance between Program and Design Development assignable areas.
 3. ***Site Plans:*** Provide narrative discussion of site circulation and transportation concept, utility distribution scheme, drainage concept, and landscape design concept. Provide justification for plant selection and proposed landscape maintenance/watering plans. Identify borrow/disposal sites and any required permits. **G**
 - a. ***Drawings:*** Further develop drawings to provide, at a minimum, the following:
 - 1) **Site Layout Plans:** Further develop to show all roads and walks (indicating pavement type), accessible routes from parking and public streets to main

- facility entrance, fire apparatus and fire lanes, and site furnishings. Indicate limits of improvements adjacent buildings that could impact the project. **G**
- 2) **Site Utilities Plans:** Show existing and proposed sizes and locations/tie-ins of all utilities, including domestic and fire protection water lines, fire hydrants, sanitary sewer lines, and steam and chilled water tunnels/lines. **G**
 - 3) **Landscape Design Plan:** Define total scope of landscaping, size/location of major existing trees and features scheduled to remain, proposed planting beds, and range of proposed irrigation systems as applicable. **G**
- b. **Calculations:** Provide site and building storm drainage calculations, parking calculations, and dewatering calculations, as applicable. **G**
4. **Architecture:** Further develop narrative discussion by system to address refinements of building massing, circulation and access to major spaces, justification for major materials and finishes to be used, justifications for any project-dependent proprietary products, planned methods/systems for exterior maintenance, and a list of options being proposed to control scope/cost. Address incorporation of all Government-provided furniture, fixtures, and equipment. **G**
- a. **Drawings:** Further develop Schematic drawings and provide at a minimum:
- 1) **Floor Plans:** Double line plans for each floor and typical floor at appropriate scales showing rooms, departmental areas and adjacencies, and identifying each room or space. Show all vertical pipe and duct spaces, columns, and other principal features. Show special equipment areas at enlarged scale. **G**
 - 2) **Elevations:** Elevations of each exterior face indicating entrances, window arrangements, doors, etc., exterior materials with major vertical/horizontal joints, roof levels, and dimensions to floor/roof lines. **G**
 - 3) **Building Sections:** Longitudinal and cross sections through the full building showing floor-to-floor and other critical dimensions, floor construction and interstitial spaces, raised floor areas, typical ceiling heights, stairs and elevators penthouses, and roof construction. **G**
 - 4) **Typical Wall Sections:** Develop a minimum of one wall section that represents conditions at a typical point on the exterior building envelope that clearly indicates insulation, vapor retarders, and glazing. **G**
 - 5) **Schedules:** Include a preliminary schedule of floor, wall, and ceiling finishes proposed for typical rooms and spaces. Clearly indicate any Government furnished or installed equipment in schedules. **G**
 - 6) **Roof Plans:** Provide plan, at same scale as floor plans, indicating roof high points, slopes, valleys, drain locations and any penthouses. **G**
- b. **Calculations:** As applicable, provide exterior envelop dew point calculations, acoustical calculations, and toilet fixture counts. **G**

5. **Structural Systems:** Refine narrative discussion of selected framing and foundation system. Clearly identify design criteria employed. List all live, dead, and wind loads utilized. Include soils investigation and materials report. **G**
- a. *Drawings:* Provide framing plans, at the same scale as the architectural floor plans, and key details. **G**
 - b. *Calculations:* Provide gravity load, lateral load, foundation and vibration calculations; and evidence the design is not subject to progressive collapse. For all computer generated results, submit a model of the input data and program material to allow understanding of the output. **G**
6. **Mechanical Systems:** Provide a narrative of the HVAC system with discussion of general features, configuration, and how it integrates with architectural building systems. Complete definition of HVAC equipment. As appropriate to the project, discuss recommended energy sources and means of energy conservation. Provide notation of outdoor summer and winter design conditions, and indoor design conditions and special requirements, ventilation requirements, indoor relative humidity design conditions and special requirements, and building block heating and cooling loads. **G**
- a. *Drawings:* Further develop Schematic drawings to provide the following:
 - 1) *Mechanical Floor Plans:* Plans, at the same scale as the architectural floor plans, that shows the main zones and distribution systems for both ducts and mechanical piping. Define all required mechanical spaces. For alterations, clearly show connections points to existing systems. System schematics and flow diagrams. **G**
 - 2) *Plumbing Floor Plan:* Provide diagrammatic floor plan for each floor, at the same scale as the architectural floor plans, that shows the main supply and soil routing for domestic water systems. Discuss specialized areas as appropriate. **G**
 - a. *Calculations:* Provide computerized building energy analysis. Report energy broken into five categories: heating, air conditioning, lighting, domestic hot water, and other (summarize items included in “other”). Summarize utility consumption in a schedule that addresses the following (as applicable): **G**
 - 1) Electricity KVA
 - 2) Steam lbs/hr
 - 3) Chilled water gpm and Tons
 - 4) Domestic water gpm
 - 5) Fire Flow gpm
 - 6) Irrigation gpm
 - 7) Sanitary gpm
 - 8) Storm Total impervious Area, sq.ft. or acres

7. **Electrical Systems:** Provide updated narrative discussion of the design, including basic assumptions and points of interconnection with existing electrical and fire alarm systems. For renovations or alteration work, update statement from the Schematic phase of the impact of the new construction to any existing distribution systems, telephone, and signal inter-building systems (F/A, CCTV, security, clock systems, legislative call system, etc.) associated with the new work. Describe work phasing plan. **G**
- a. **Drawings:** Further develop Schematic drawings to provide the following:
- 1) **Floor Plans:** Indicate location and sizes of electrical and emergency equipment and include room titles and area functions. Reference electrical plans to the architectural floor plans. Provide separate distribution plans for lighting, power, and telecommunication layouts. **G**
 - 2) **Electrical Rooms:** Provide minimum 1/8" scale plans of all electrical rooms indicating the adequacy of the new electrical equipment layout. **G**
 - 3) **Single-Line Diagrams:** Submit a clear enhanced single-line diagram of the proposed electrical system (normal and emergency). Include in the diagram low voltage panelboards, branch circuit panels and representative methods of feeding 277/480 volt, (if required) and 120/208 volt normal and emergency panels. Include preliminary design of proposed lighting and lighting controls, dimmers, location of cove lighting, etc. Describe the methods and assumptions used for lighting foot candle level calculations. **G**
 - 4) **Riser Diagrams:** Submit single-line riser diagrams for fire alarm systems and empty conduit raceway system riser for security and telecommunication systems. **G**
 - 5) **Materials:** Provide lighting fixture product data (cuts), and cuts of any other major electrical components which will require AOC approval. **G**
- b. **Calculations:** Submit preliminary load calculations for both normal and emergency power distribution systems. Break down calculations into lighting, receptacles and power. Include current demand load and projected load of new construction. For alterations and additions, indicate if the existing panels meet the new loads and available short circuit rating. **G**
8. **Fire Protection:** Refine narrative from Schematic Phase to clearly define occupancy classifications, ratings of structural components, classification of interior finishes, and location of fire-rated walls and partitions. Clearly identify any special hazard designs if applicable (smoke evacuation, etc.). Identify code sections used and review the building for compliance with life safety codes and discuss the design's impact on security requirements. Highlight any requirements for use of code equivalencies or exceptions. Provide egress information with tabular listing of number and type of each exit, loads at each exit, and travel distances with path widths and capacities noted. Indicate planned configuration of sprinkler system, types of sprinklers to be used and the minimum required residual pressure required for each type, and concepts of fire notification and alarming. **G**

- a. **Fire Protection Drawings:** Provide fire protection plans for each floor, at same the scale as the architectural floor plans, that show fire alarm zones, sprinkler zones and associated occupancy hazard, smoke zones, equipment spaces for fire protection systems, standpipe and locations, sprinkler main sizes, zone valves, and flow switches, locations and ratings of fire walls and smoke barriers. Provide cover sheet listing codes employed, edition, and major sections. **G**
 - b. **Calculations:** Provide NFPA occupant loads and area for each space and full egress calculations, sprinkler hydraulic calculations with pressure losses associated with all components and applied to most distant sprinkler, and notation of software used. **G**
9. **Security Systems:** See Schematic Phase. **G**
10. **Food Service Systems:** Prepare full layouts of food preparation areas and food service areas, noting required electrical and mechanical services. **G**
- D. **Outline Specifications Submission:** Refine outline specifications, using *MasterFormat*, that indicate materials and types of construction which may at this point include brand names to establish quality and function (see [Part 6 and Appendix 6b](#) for examples). Provide short-form sections for key, project determinate products or systems. Include a description of each HVAC, plumbing, electrical, and fire protection system concept. **G**
- E. **Cost Estimates Submission:** Prepare cost estimates in accordance with ASTM E-1804, *Standard Practice for Performing and Reporting Cost Analysis During the Design Phase of a Project*, Paragraph 6.4, *Design Development Phase Estimate*. Prepare the Design Development estimate using Unifomat II, Level 3 (ASTM E-1557) based on Design Development floor plans, outline specifications for principle materials, finishes, and building systems, and typical unit costs for structural, mechanical, and electrical systems. Reduce the design contingency from that used during Schematic Phase. Reduce the design contingency from that used during Schematic Phase. Provide allowances for materials or systems not yet defined. (See Appendix 8c). **G**
- F. **Design Review Deliverables:** When documents are approved for submission, provide the AOC with the full sets of documents for distribution to reviewing offices. Allow a minimum of 3 work days for internal distribution by AOC staff prior to the required Kick-Off review conference.
 1. Provide a minimum of eight (8) sets (or the number enumerated in the Professional Services Contract) of unmounted drawings reduced to half size plots. **G**
 2. Provide one set of full-size drawings (plans and elevations by discipline) mounted on foam board. **G**
 3. Provide eight (8) sets (or the number enumerated in the Professional Services Contract) sets of calculations, specifications, and cost estimates bound into 8-1/2" x 11" brochures. **G**
 4. Deliver required databases on standard *MS Windows NT* or *XP* formatted 3-1/2" floppy, a CD-ROM, or ZIP disks. **G**

- G. **Kick-Off Review Conference:** The Associate A/E shall conduct a formal, technical presentation to the AOC Project Team following the initial 3-day AOC document distribution period. **G**
- H. **AOC Discipline Review Conference:** The Associate A/E shall allow a minimum of 7 calendar days for AOC review following the Kick-Off review conference and then meet with individual design discipline teams to fully discuss each discipline's work. **G**
- I. **Wrap-Up Review Conference:** A minimum of 7 calendar days after the Discipline Review Conference, the Associate A/E shall meet with the AOC to discuss and clarify preliminary comments prior to comment consolidation and delivery to the Associate A/E. Review comments will be forwarded to the Associate A/E using the standard AOC spreadsheet format. The Associate A/E shall respond to comments within 7 calendar days. **G**
- J. **Back-Check:** Resolve and document responses to all agency comments. Obtain approval to responses prior to proceeding with the next phase. Incorporate required revisions to drawing files prior to proceeding to next phase to ensure that all participants are working from the same coordinated design. Submit revised record set to the AOC Project Manager. *Design should effectively end now!* **G**
- K. **Formal Presentations & "On-Board Reviews":** The Associate A/E shall prepare a formal presentation of the Design Development Design to both the Client, required Congressional or Judicial oversight committees, and such public presentations as may be identified by the AOC. Such presentations shall include large scale mounted plots of architectural floor plans that clearly explain the design response to *Building Program*. As appropriate, supplement the mounted plans with diagrammatic images and space/area charts or tables that summarize adherence to requirements [and samples of principal finishes and materials](#). The Associate A/E should plan on having the lead design professional from each major discipline in attendance at these presentations to answer questions. If provided in the Professional Services Contract, provide a presentation model to explain the project's relationship to surrounding areas and buildings. **G**
 - 1. The Associate A/E shall prepare for the number of formal presentations specified in the Professional Services Contract. **G**

41.6 CONSTRUCTION DOCUMENTS - 50% PROGRESS SUBMISSION

- A. **Construction Documents - 50% Completion:** A submission of the draft contract documents and supportive material which clearly show the progress of the project to the 50% construction document stage. Include review comments and responses from the preceding phase. Any changes necessitated by development of the construction documents shall be clearly highlighted to allow for review and approval.
 - 1. **Space Studies:** Update area tabulations entered in the space spreadsheet during earlier design phases. After finalizing the space layouts, updates of the spreadsheet may be discontinued provided data remains unchanged during subsequent submissions. **G**

2. **Room Name/Numbers:** Begin assigning final AOC approved room names and numbers, utilizing the numbering system provided by the AOC. **G**
3. **Furniture, Fixtures, and Equipment (FF&E):** As applicable, clearly indicate coordination with Government furnished FF&E. **G**
- B. **Pre-Submission Procedures:** Prior to production of the review sets, the AOC Project Manager shall meet with the Associate A/E to review one complete set of documents and verify that the intended submittal possesses the information required for the AOC's review process. **G**
- C. **Construction Documents:** Provide a title sheet and a complete drawing list for the planned construction document set. Submit the following for the 50% progress review: **G**
 1. **Site Plans:** Provide narrative discussing design revisions made subsequent to Design Development. Commence preparation of final construction drawings and specifications.
 - a. **Drawings:** Develop drawings to provide final configurations, at a minimum, for: existing and new topography and utilities, public roads and walks, access roads, extent of parking, relationships to other buildings, final *limits of construction*, and site furnishings. **G**
 - b. **Calculations:** Provide grading and water run-off calculations, as appropriate. **G**
 2. **Architectural Drawings and Samples:** Provide narrative discussing revisions made to the design subsequent to Design Development. Commence preparation of final construction drawings and submit required samples. **G**
 - a. **Drawings:** Further develop drawings to provide, at a minimum, the following:
 - 1) **Floor Plans:** Provide Double Line Floor Plans at appropriate scales showing rooms, departmental areas and adjacencies, identifying each room or space, and showing all major built-in features. Typical conditions that repeat or conditions of design complexity shall be fully developed. **G**
 - 2) **Roof Plans:** Provide roof plans at same scale as floor plans, indicating roofing high points, slopes, valleys, expansion joints, drains locations, plumbing vents, roof equipment, roof walkways, and penthouses. **G**
 - 3) **Elevations:** Elevations of each exterior face indicating entrances, window arrangements, doors, etc., exterior materials with major vertical/horizontal joints, roof levels, and dimensions to floor/roof lines. **G**
 - 4) **Building Sections:** Longitudinal and cross sections through the full building (at scales consistent with the floor plan drawings), to illustrate the relationships between floors and spaces and their interfaces with structural systems. **G**
 - 5) **Typical Wall Sections:** Provide wall sections at an appropriate scale, that represent conditions at all typical points on the exterior building envelope and at all special conditions. **G**

- 6) *Details:* Provide detail drawings for all architectural and structural interfaces between members and at openings, terminations, and transitions as required to fully explain the construction proposed and specifically all “design dependent” details upon which major design decisions are based. **G**
 - 7) *Schedules:* Provide schedules for each generic type of door, window, hardware set, major piece of equipment, and finish for all room and space types. **G**
 - 8) *Samples:* Provide material and color samples as appropriate for critical and typical areas of the architectural design. **G**
 - 9) *Demolition Plans:* For renovation and modernization projects, provide demolition plans at scales consistent with the floor plan drawings. **G**
3. **Structural Systems:** Provide updated discussion of structural system, noting any changes from the Design Development submission. Reconcile foundation plans to soils investigation reports. Provide final soils and materials investigation reports. **G**
 - a. *Drawings:* Provide, at a minimum, the following:
 - 1) *Foundation Plans:* Provide initial foundation plans, completed to at least 50% completion, plotted at the same scale as the architectural floor plans. **G**
 - 2) *Structural Framing Plans:* Provide initial framing plans, fully dimensioned, completed to at least 50% completion, plotted at the same scale as the architectural floor plans. Provide live loads for all areas (or classes of areas) on the structural plans. **G**
 - 3) *Details:* Provide fully developed details for principle structural connections and interfaces with architectural systems. **G**
 - 4) *Demolition Plans:* As applicable, provide demolition plans. **G**
 - 5) *Schedules:* Complete structural schedules for major systems. **G**
 - b. *Calculations:* Provide final structural calculations for major systems and necessary material data to support framing plans designed. Include all loads, supports for non-structural elements (including mechanical and electrical equipment), and any blast analysis (as required by the Professional Services Contract). **G**
4. **Mechanical Systems:** Provide narrative description of HVAC system. Provide all equipment and system data justified by indicating the basis for the data.
 - a. *Drawings:* Provide drawings, as appropriate, for the following:
 - 1) *Demolition Plans:* Provide for renovation and modernization projects. **G**
 - 2) *Mechanical Floor Plans:* Provide resolved floor plans for each floor, at the same scale as the architectural floor plans, that shows the main distribution systems for both ducts and mechanical piping. All dampers, both fire dampers and volume control dampers, must be shown. **G**
 - 3) *Equipment Room Plans:* Provide large scale equipment room plans where required to show adequate clearances and detail. **G**

- 4) *Plumbing Floor Plans:* Provide a resolved floor plan at same scale as architectural floor plans, that shows the main systems (cold water, hot water, hot water recirculating, and all major equipment). Diagram major risers and provide design calculations. Discuss specialized areas as appropriate. Show routing of sanitary, waste and storm drainage piping systems. Provide 1/4" scale toilet room piping layouts, riser diagrams and design calculations. All valves must be shown & labeled. Indicate locations where temperature, pressure and flow gauges are required. **G**
- 5) *Schedules:* Complete mechanical schedules for all major equipment. **G**
- b. *Calculations:* Mechanical calculations shall be complete including data necessary to justify equipment shown in submitted drawings. Provide calculations including block loads for heating and cooling, heat loss calculations for building envelope, room load and supply air calculations, and flow and head calculations for pumping systems. **G**
 - 1) *Design Conditions:* Verify notation of outdoor summer and winter design conditions, indoor design conditions and special requirements, indoor relative humidity design conditions and special requirements, room heating and cooling loads, building block cooling loads, system loads, and psychometric calculations. Include the basis and amount of heat gain for people, lighting, and equipment, all building envelope "U" values, and outside air used for each system. When infiltration loads exist, show basis and calculations. **G**
 - 2) *Equipment Selection Data:* Provide air balance summary tabulating supply, return, outside air, and exhaust air CFM for each system. Provide water balance summary tabulating GPM of water to each primary and secondary piece of equipment for each pump, each system, each chiller and boiler. **G**
 - 3) *Terminal Loads:* Provide a summary of heating and cooling requirements met by each terminal device (VAV box, fan coil unit, etc.), each secondary piece of equipment (air handling unit), and each primary piece of equipment (chiller or boiler). Include control system diagrams with sequence of operation. **G**
5. *Electrical Systems:* Provide narrative discussion of power systems, including estimated loads and single line diagram indicating sizes of transformers, major distribution equipment, and emergency generators or UPS units. Include cuts of proposed light fixtures. **G**
 - a. *Drawings:* Provide, at a minimum, the following:
 - 1) *Lighting Floor Plans:* Submit plans referenced to architectural plans showing location of all fixtures, switches, and associated lighting control equipment. Indicate locations for emergency lighting. **G**
 - 2) *Power Plans:* Submit power plans showing locations of all panels, receptacles, motor control centers, major feeders to mechanical equipment, and required spaces for conduit chases and clearances required. **G**

- 3) *Distribution:* Space requirements and layouts of major electrical distribution equipment and rooms. Show location of all major components of primary and secondary distribution system including normal and emergency panels, transformers and all other major items drawn to scale. Indicate on the 1/4" scale plan, the electrical equipment to be installed in each closet. **G**
 - a) *Branch Wiring:* Show routing and methods of conduit routing through any historic or special areas. **G**
- 4) *Service:* Show routing of all underground feeders and services. **G**
- 5) *Special Systems:* Show on plans location of Fire Alarm, CCTV, Intercom and other Signal requirements. Provide riser diagrams. Indicate fire alarm devices single-line riser diagram, and methods to connect to existing system. **G**
- 6) *Telecommunication and Security:* Show locations of telecommunication and security equipment in closets and single-line riser/distribution diagrams. **G**
- 7) *Alteration Projects:* Provide demolition and phasing plans to indicate the complete electrical work in all areas to be renovated. Use Standard Symbols for demolition and rewiring. **G**
- b. *Calculations:* Update system load calculations, short circuit studies, voltage and power calculations. Submit lighting and power calculations, voltage drop and available short circuit ratings for electrical panels. **G**
- 6. **Fire Protection:** Provide a updated narrative discussion of the design of egress system, including doors to be equipped with panic hardware, identification and location of fire-resistive assemblies, including walls, partitions, and floors. If equivalencies are proposed for renovation or alteration of existing space, fully define proposed equivalent designs and included appropriate calculations or fire models to support the proposal. **G**
 - a. *Fire Protection Drawings:* Provide fire protection plans indicating location of fire service mains, fire hydrant locations, water supply source, general routing of standpipes and sprinkler piping showing valves and other system components, including pipe sizes, and fire pump location. Indicate locations for emergency and exit lighting. Indicate final locations of all alarm srobes, annunciation panels and sub-panels. Indicate typical coordination of sprinklers with reflected ceilings. Include details of sprinkler riser, fire pump, and plan of fire protection room. **G**
 - b. *Riser Diagram:* Provide riser diagrams to include all piping sizes and components starting at entry to building. Include backflow preventor, valves, alarm valves, zone valves, tamper switches, flow switches, drain connections, fire pump, jockey pump, check valves, relief valves, etc. **G**
 - c. *Calculations:* Refine final fire protection analysis and supporting data showing calculations used and tabulated data showing water flow requirements to the standpipe(s) and sprinkler systems. Provide design of and calculations for the smoke exhaust systems. Submit all calculations required by appropriate NFPA

sections and their associated appendices, except where made more stringent by the AOC. **G**

7. **Food Service Systems:** Meet with the AOC Sanitarian and review plans of food preparation areas and food service areas. **G**
 8. **Project Specifications:** Begin conversion of outline specification to final formats. Develop sections specifying special design or procurement needs to final formats and detail in order to substantiate key design decisions. Submit drafts of remaining sections using “striked-out” masters or annotated copies of office masters that clearly show data retained and deleted. As applicable, specifications shall be based on AOC Guide specifications. Eliminate references to proprietary brand names at this phase. **G**
 9. **Cost Estimates Submission:** Prepare cost estimates in accordance with ASTM E-1804, *Standard Practice for Performing and Reporting Cost Analysis During the Design Phase of a Project*, Paragraph 6.4, *Design Development Phase Estimate*. Prepare the Construction Documents Phase estimate using Uniformat II, Level 3 (ASTM E-1557) based on Construction Documents Phase floor plans, outline specifications for principle materials, finishes, and building systems, and typical unit costs for structural, mechanical, and electrical systems. Update any cost estimate furnished under the previous stage clearly identifying any modifications to previous submittals. Indicate how cost estimates that are out of range will be brought into conformance with budget requirements. Reduce design contingencies as specified in Part 8. See Appendix 8d. **G**
- D. **Design Review Deliverables:** When documents are approved for submission, provide the AOC with the full sets of documents for distribution to reviewing offices. Allow a minimum of 3 work days for internal distribution by AOC staff prior to the required Kick-Off review conference.
1. Provide a minimum of eight (8) sets (or the number enumerated in the Professional Services Contract) of unmounted drawings reduced to half size plots. **G**
 2. Provide eight (8) sets (or the number enumerated in the Professional Services Contract) of calculations, specifications, and cost estimates bound into 8-1/2" x 11" brochures. **G**
 3. Deliver required databases on standard *MS Windows NT* or *XP* formatted 3-1/2" floppy, a CD-ROM, or ZIP disks. **G**
- E. **Kick-Off Review Conference:** The Associate A/E shall conduct a formal, technical “overview” presentation to the AOC Project Team following the initial document distribution period. **G**
- F. **AOC Discipline Review Conference:** The Associate A/E shall allow a minimum of 7 calendar days for AOC review following the Kick-Off review conference and then meet with individual design discipline teams to fully discuss each discipline’s work. **G**
- G. **Wrap-Up Review Conference:** A minimum of 7 calendar days after the Discipline Review Conference, the Associate A/E shall meet with the AOC to discuss and clarify preliminary

comments prior to comment consolidation and delivery to the Associate A/E. Review comments will be forwarded to the Associate A/E using the standard AOC spreadsheet format. The Associate A/E shall respond to comments within 7 calendar days. **G**

41.7 CONSTRUCTION DOCUMENTS (100%) FINAL SUBMISSION

A. **Construction Documents - 100% Completion:** Complete construction documents preparation during this phase. Refine documents to incorporate revisions to meet AOC comments provided during the previous stage. Provide a final updating of the following:

1. **Design Commentary:** Descriptions of various features and a listing of any differences between the *Building Program* and the final design. Provide a final Code Analysis at this Phase, listing compliance required occupancy, life safety, fire resistance, and structural adequacy. **G**
2. **Space Studies:** Update area tabulations contained in the spreadsheet developed during the Schematic Phase containing at a minimum the following data fields: **G**
 - a-f. Fields as listed in the Schematic Phase Table.
 - g. Final Space Space Name.
 - h. Final Net Assignable Square Footage for each Space.
 - i. Variance between Program and 100% Construction Documents assignable areas.

B. **Pre-Submission Procedures:** A conference will be held to review the 100% Construction Documents Phase Documents. Prior to the Associate A/E's production of the review sets, the Project Manager shall meet with the Associate A/E to review one complete set of documents and verify that the intended submittal possesses the information required for the AOC's review process. In addition, provide: **G**

1. **Cost Estimate Draft Submission:** Submit for review a draft construction cost estimate prepared in accordance with ASTM E-1804, *Standard Practice for Performing and Reporting Cost Analysis During the Design Phase of a Project*, Paragraph 6.5, *Construction Document Phase Estimate*. Prepare the estimate using Uniformat II, Level 4 (ASTM E-1557) based on 100% construction document floor plans, specifications for all materials, finishes, and building, mechanical, and electrical systems. Include detail reports with full crew resource loading. Remove all design contingency. Perform value engineering analysis as required to ensure bidding within funding limitations and to assist in definition of any necessary Bid Options. See Appendix 8d. **G**

C. **100% Construction Documents:**

1. **Site Plans:** Site plan developed to completion state with all existing and new topography and utilities, public roads and walks, access roads, extent of parking, and relationships to other buildings fully resolved and awaiting final approval. **G**
2. **Architectural, Structural, Mechanical, Electrical, and Fire Protection drawings and Samples:** The complete set of construction documents, fully resolved and only awaiting final approval of the AOC. **G**

3. **Final Calculations:** Provide final calculations for major systems and necessary material data to support all equipment, materials, and systems used in the final construction documents. **G**
 4. **Project Specifications:** 100% of the sections complete, printed in final format complete with applicable project number and title on every page. **G**
 5. **Cost Estimates Submission:** Update the draft submitted above and incorporate AOC review comments. Final cost estimate submissions shall provide an estimate for each base bid, option (alternate), and unit price. **G**
- D. **Design Review Deliverables:** When the documents are approved for submission, the Associate A/E shall provide the AOC, within 5 working days, with full sets of documents for distribution to reviewing offices. Allow a minimum of 10 work days for review by AOC staff prior to the required review conference.
1. Provide a minimum of 8 sets (or the number enumerated in the Professional Services Contract) of unmounted drawings reduced to half size plots. **G**
 2. Provide 8 sets (or the number enumerated in the Professional Services Contract) of calculations, specifications, and cost estimates bound into 8-1/2" x 11" brochures. **G**
 3. Deliver required spreadsheets on standard 3-1/2" *MS Windows NT* or *XP* formatted floppy disks or CD-ROMs. **G**
- F. **Kick-Off Review Conference:** The Associate A/E shall conduct a formal, technical "overview" presentation to the AOC Project Team following the initial document distribution period. **G**
- F. **AOC Discipline Review Conference:** The Associate A/E shall allow a minimum of 7 calendar days for AOC review following the Kick-Off review conference and then meet with individual design discipline teams to fully discuss each discipline's work. **G**
- G. **Wrap-Up Review Conference:** A minimum of 7 calendar days after the Discipline Review Conference, the Associate A/E shall meet with the AOC to discuss and clarify preliminary comments prior to comment consolidation and delivery to the Associate A/E. Review comments will be forwarded to the Associate A/E using the standard AOC spreadsheet format. The Associate A/E shall incorporate comments/revisions into the Backcheck submission. **G**

41.9 CONSTRUCTION DOCUMENTS - BACKCHECK SUBMISSION

- A. **Construction Documents - Final:** Correct 100% construction documents to incorporate revisions to comply with final AOC review comments. Submit final comment log with all comments resolved. **G**
- B. **Construction Documents - Drawings:** The complete set of construction documents, fully resolved and only awaiting final approval and reproduction by the AOC. **G**

- C. **Final Engineering Calculations:** Provide final calculations for major systems and necessary material data to support all equipment, materials, and systems used in the final construction documents. **G**
- D. **Project Specifications:** 100% of the sections complete, printed in final format complete with applicable project number and title on every page. **G**
- E. **Cost Estimates Submission:** Update final cost estimate to reflect Backcheck comments. **G**
- F. **Documents Review and Final Deliverables:** Submit final deliverables:
 - 1. Provide a one complete set of polyester reproducible, plotted at full-size, ready for final reproduction and bidding and a minimum of 8 bound full-size and half-size sets (or the number enumerated in the Professional Services Contract) of drawings. **G**
 - 2. Provide 8 sets (or the number enumerated in the Professional Services Contract) of calculations, and cost estimates bound into 8-1/2" x 11" brochures. **G**
 - 3. Provide one camera-ready, unbound copy original of the Project Manual and 5 bound copies. **G**
 - 4. Deliver required spreadsheets on standard 3-1/2" *MS Windows NT* or *XP* formatted floppy disks or CD-ROM. Deliver other required deliverables in accordance with applicable Parts of this A/E Design Manual. **G**

41.10 PROCUREMENT PHASE

- A. **General:** Large projects will typically be prepared for formal bidding by either Invitation for Bids (IFBs) or Request for Proposals (RFPs). Occasionally, the project may utilize Solution Order Contracts (SOCs). The document preparation is similar for each with the variance between them resting principally with the Bid Schedules and Options rankings. The Associate A/E shall cooperate fully with the Project Manager in the final preparation of the Procurement package, in Bidder's Site Visits and Meetings, and the preparation of [Amendments](#).
- B. **Preparation of Procurement Documents:** The Associate A/E shall prepare the construction document sets for reproduction by the AOC. The Associate A/E shall cooperate with the Project Manager to verify the accuracy of the lists/indexes of drawings and Project Manuals being issued. Provide full-size camera-ready reproducible of all drawings and a camera-ready copy of the Project Manual. Full requirements for Lists of Submittals, etc., are listed in Part 6, The Project Manual. In addition, submit the following to the AOC Project Manager:
 - 1. **Options:** Any Options (Alternates) as developed with the AOC Project Manager, numbered in sequence of preferred acceptance, and fully described as to scope. **G**
 - 2. **For RFPs:** Coordinate the preparation of suggested evaluation criteria for prospective Contractors with the AOC Project Manager. **G**
- C. **Attendance at Bidder's Meetings:** The AOC Project Manager will schedule the Bidder's Meeting in coordination with the AOC Procurement Division and the Associate A/E. The Bidder's Meeting will be scheduled approximately 7 days after the start of the bid period. The

Associate A/E will conduct the Bidder's Meeting, compile meeting minutes and tabulate the list of Requests for Interpretation (RFI) for resolution. **G**

- D. **Site Visits:** Coordinate the timing of Bidder's site inspection visits with the Project Manager and the AOC Construction Manager, conduct such visits, record lists of questions raised by attendees, and coordinate the resolution of these questions with the Project Manager and the AOC Procurement Division for incorporation in [Amendments](#). **G**
- E. **Preparation of [Amendments](#):** All [amendments](#) which are required to clarify the bidding documents, respond to RFIs, accomplish revisions, accept or reject substitutions, and correct errors shall be prepared by the Associate A/E and forwarded to the AOC Project Manager for approval and subsequent distribution by the AOC. Prepare [amendments](#) in formats similar to those used in the Project Manual, listed in the order of the Project Manual and drawings, [amendments](#) numbered sequentially and dated. Do not include Bidder's Meeting minutes in addenda. Issues forwarded to the Associate A/E by bidders shall be reviewed, determinations made, and draft text forwarded to the AOC Project Manager within 5 calendar days of the bidder's [amendments](#) request for inclusion in the [Amendments](#). **G**
- F. **Receipt of Bids and Evaluation:** The Associate A/E may be present during the opening of bids, but is advised of the confidentiality rules concerning opening of bids. The Associate A/E shall assist the AOC in the evaluation of the bids. **G**
- G. **Post Bid Revisions:** The Associate A/E shall enter all approved revisions to the Project Manual and the drawing reproducible masters, annotated with approved revision symbols and underscoring, and deliver the annotated sheets to the AOC for reproduction of construction sets. Only sheets or pages bearing revisions need to be resubmitted. The Contractor will be informed that the published [amendments](#) remain the legal basis for the project. **G**

41.11 CONSTRUCTION ADMINISTRATION PHASE

- A. **General:** This section addresses jointly shared construction administration responsibilities provided for Large Projects - distributed between the Associate A/E and the AOC. These responsibilities may differ from those employed in the private sector or with other Federal agencies. While the AOC Project Manager retains overall responsibility for delivery of the project, the day-to-day management of the construction and communication with the Associate A/E will evolve to the AOC Construction Manager.
1. **Professional Services Contract:** Services in this section are dependent on option for Construction Administration being exercised in the Professional Services Contract. **G**
 2. **Procurement Methods:** Large projects are usually procured via formal Invitation for Bids or Requests for Proposals. Occasionally, major projects may be constructed through the use of Solution Order Contracts (SOC). The provisions of this section are prefaced on the use of those construction vehicles.
 3. **Requested Attendance:** As the lead member of the design team, the Associate A/E is requested to attend both the Ground Breaking ceremony and the Ribbon-Cutting ceremony.

4. **Document Annotation:** Ensure that all construction documents have been annotated to reflect modifications issued during the Bid period and to reflect any Options exercised by the AOC. **G**
 5. **Site Access:** Authorized representatives of the Associate A/E shall have access to the Project Site at all times in which work is being performed.
 6. **Limitations on authority of architect-engineer:** Unless specific exceptions are established by a written instruction issued by the contracting officer, the Associate A/E firm:
 - (a) shall not authorize any deviation from the construction contract documents or approve any substitute materials or equipment.
 - (b) shall not exceed limitations on the government's authority as set forth in construction contract documents.
 - (c) shall not undertake any of the responsibilities of the contractor, subcontractors, construction contractor's superintendent or contractor quality control representative.
 - (d) shall not expedite or accelerate the work of construction contractor and subcontractors.
 - (e) shall not advise on or issue directions relative to any aspect of the means, methods, techniques, sequences or procedures of construction unless such is specifically called for in construction contract documents. (*FAR-5252.236*)
- B. **Project Administration:** The Associate A/E shall direct all communications with the Contractor through the AOC Construction Manager except as specifically provided herein.
1. **Mobilization/Project Startup:** The Associate A/E will be notified by the AOC of the Contractor's successful completion of mobilization procedures required by the Construction Contract, completion of required pre-construction submittals, and the Contractor's schedule to commence site operations: **G**
 - a. **Pre-Construction Meeting:** The Associate A/E shall coordinate the time, date, and location of the Pre-Construction Meeting with the AOC Construction Manager, and shall conduct the meeting, record the minutes of the meeting and distribute them to all members of the Project Team. **G**
 2. **Progress Meetings:** The Associate A/E shall conduct the bi-weekly field meetings, prepare the minutes and distribute them to the Project Team.
 3. **Construction Field Observation:** The Associate A/E shall visit the Project and conduct on-site observations of the Work at intervals appropriate to the stage of construction but in no case less than on a bi-weekly basis. This observation may coincide with the dates of the Progress Meetings.
 4. **Construction Conferences:** At times necessitated by construction conditions, attend construction conferences and notify the Construction Manager of any errors in the minutes or unresolved issues.

C. Projects Controls and Decision Expediting:

1. **Clarifications and Interpretations:** The Associate A/E shall review and recommend for action all requests for clarification or interpretation forwarded by the Contractor within the time periods provided.
 - a. **Contractor Error:** Costs for processing RFIs resulting from oversight or failure to locate properly documented information on the part of the Contractor will be charged to the Contractor.
 - b. **Errors & Omissions:** RFIs resulting from discrepancies, errors, or omissions shall be resolved without cost to the Government.
 - c. **Routing:** The Associate A/E shall forward its response to the Contractor and the AOC Construction Manager within 5 calendar days of receipt. Should the AOC take exception to any response, the AOC Construction Manager will notify all parties of this exception within 2 calendar days. If the Contractor's RFI is highly involved or will clearly require more than 5 days to resolve, the Associate A/E shall notify both the Contractor and the AOC Construction Manager as soon as possible after identification of the complexity.
2. **Processing of Submittals:** The Associate A/E shall review and recommend for action all submissions of product data, shop drawings, calculations, coordination drawings, samples, and mock-ups for compliance with Contract Documents, consistency between drawings and specifications, consistency between disciplines, and reasonableness of tolerances. The Associate A/E shall ensure that the Contractor has properly reviewed, coordinated, and stamped all submittals prior to submitting them for approval. The Associate A/E shall ensure that submittals do not deviate from contract requirements. The Associate A/E is responsible for proper coordination of the reviews of its sub-consultants.
 - a. **Compliance with Contract Documents:** Special attention to both performance and prescriptive specifications is required due to the "open" nature of government bidding. Ensure that submissions of "approved equals" comply fully with specified salient characteristics. *The burden of proof as to a product's equality rests with the Contractor requesting use of an approved equal.* Ensure that the Contractor has documented that submitted "approved equals" do not introduce incompatibilities with other work on the project. Further ensure that submitted "approved equals" are not requests for "contract modifications" or "change orders." Verify inclusion of necessary field measurements for all equipment requiring field fitting.
 - 1) **Calculations:** Ensure that required calculations prepared to demonstrate product or material compliance with specifications are accurate and that they bear the seal of a professional licensed to practice in the District of Columbia.
 - 2) **AOC Review:** The AOC reserves the right to review a pre-identified subset of submittals to verify conformance to AOC operational requirements and either concur with Associate A/E's notations or to request further review prior to their return to the Contractor. Should the AOC make any annotations, the Associate A/E shall review the AOC annotations to verify

their compliance with the Contract Documents. If in the opinion of the Associate A/E any AOC annotations constitute a change to the contract, the Associate A/E shall notify the AOC in order to obtain a decision as to whether or not the Government wishes to forego annotations or to proceed with a Contract Modification.

- b. **Annotation:** Comply with Architect's Action notations specified in AOC Division One sections. Mark and stamp a single set of shop drawing reproducibles. The Contractor is responsible for the production of multiple copies for his use. Retain a minimum of one copy of each annotated shop drawing for the Associate A/E.
 - c. **Processing Time:** Process within 10 calendar days of receipt. Submittals requiring review and coordination with the Associate A/E's sub-consultants are allowed an additional processing time of up to 5 calendar days. Hold submittals requiring coordination with other submittals until all required submissions are received. Monitor submittals received against approved Contractor Submission Schedule.
 - d. **Routing:** The processed submittals shall be forwarded back to the AOC Construction Manager.
- D. **Certifications and Test Reports:** The Associate A/E shall review and recommend for action all Contractor certifications and test reports.
 - 1. **Certifications:** Ensure that products and materials requiring certification of compliance with required standards and tests have proper certifications submitted. Retain copies for record.
 - 2. **Test Reports:** Associate A/E shall review and approve testing laboratory results. The Associate A/E shall approve the procedures for and observe the initial iterations of all field tests for such areas as air balancing, elevator load tests, etc. Ensure that where required manufacturer's representatives are present to approve any installations or tests required for provisions of warranties.
- E. **Requests for Payment:** The Associate A/E shall make the initial review of Contractor Requests for Payment, shall certify the amounts due to the Contractor, and shall forward all such requests, with the Associate A/E's recommendation for action to the AOC Construction Manager.
- F. **Construction Modifications (Change Orders):** The Associate A/E shall process and recommend for action by the AOC all Change Order requests. The Change request shall be analyzed for conformance with design intent, consistency, fair cost, and the effect on project schedule. Final acceptance of all Change Requests resides with the AOC. Requests for "approved equals" will not be accepted as the basis for change order requests.
- G. **Claims:** The Associate A/E shall record any occurrence or work item that may result in a claim for a change in contract time or amount. The Associate A/E shall maintain a claims log and shall refer any disputes or claims directly to the AOC Construction Manager. Provide a current copy of the claims log to the AOC at least once a month at the Progress Meeting.

1. **Processing:** Review each claim or dispute, including all documentation of any time, money or expenditure made in connection with the claim or dispute. Provide a written determination and recommendation for resolution to the AOC.
 2. **Verification:** Verify that costs incurred are properly related to the claim or dispute. Notify the AOC Construction Manager if additional on-site representation is required to monitor any disputed work.
- H. **Project Schedule Monitoring:** Associate A/E shall remain apprized of the Contractor's work progress and shall notify the AOC Construction Manager of any delays attributable to the Government.
- I. **Project Closeout:**
1. **FFE Coordination:** Coordination of Government furnished furniture, fixtures, and equipment shall be provided in accordance with the Professional Services Contract. The AOC will furnish required listings of required items and of agency representatives appropriate to the items covered.
 2. **Punch Lists:** The Associate A/E shall prepare the project "punch-list" and recommend to the AOC completion of required elements on the list. **G**
 3. **Closeout Submittals:** Ensure that training of Government employees has been conducted, Operation and Maintenance Manuals are distributed, and maintenance schedules and methods are clearly presented for implementation by the Government. Maintenance schedules and methods shall be addressed specifically to the equipment as employed in the project. **G**
 4. **Equipment Startup (Commissioning):** (Future)

41.11 CONSULTANT PROJECT CLOSEOUT

- A. **General:** As part of final project closeout collect, organize, and transmit to the AOC any revisions to specifications, construction modifications, Requests for Interpretation; etc. that have not been previously delivered to the AOC.
- B. **As-Built Documentation:** If the Professional Services Contract or Task Order requires Associate A/E preparation of "as-built" CAD files incorporating all field revisions and construction modifications update the appropriate construction drawings and forward electronic copies to the AOC. If the Professional Services Contract or Task Order requires review and approval of "as-built" CAD data prepared by others, complete that review and transmit findings to the AOC.
- C. **Final Payment to Associate A/E:** Following delivery and AOC approval of Consultant Closeout documentation, prepare and submit request for final payment.

END OF PART 41

PART 4CM - DESIGN REQUIREMENTS FOR LARGE PROJECTS UTILIZING CONSTRUCTION MANAGERS

4cm.1	INTRODUCTION
4cm.2	PROJECT STARTUP
4cm.3	BUILDING PROGRAM
4cm.4	SCHEMATIC DESIGN
4cm.5	DESIGN DEVELOPMENT
4cm.6	CONSTRUCTION DOCUMENTS - 50% PROGRESS SUBMISSION
4cm.7	CONSTRUCTION DOCUMENTS - 100% FINAL SUBMISSION
4cm.8	CONSTRUCTION DOCUMENTS - 100% BACKCHECK SUBMISSION
4cm.9	PROCUREMENT PHASE
4cm.10	CONSTRUCTION ADMINISTRATION PHASE
4cm.11	CONSULTANT PROJECT CLOSEOUT

PART 4cm - DESIGN REQUIREMENTS FOR LARGE PROJECTS UTILIZING CONSTRUCTION MANAGERS

4cm.1 INTRODUCTION

- A. **General:** Use Part 4cm, Design Requirements for Large Projects Utilizing Construction Managers, for projects for which the AOC has retained the services of a Construction Manager. Design phases for Large Projects shall conform to the definitions stated within the American Institute of Architects *Handbook* (large projects are defined in Part 2). During the planning period the Associate A/E is required to make submittals of the Phases of the Design Process that correspond with the Professional Services Contract detailing the required Phases and stages of those phases for which deliverables are required:
1. Programming Phase (as required by the Professional Services Contract).
 2. Schematic Phase.
 3. Design Development Phase.
 4. Construction Documents Phase (with intermediate stages as defined below).
 5. Procurement (Bid) Phase (as required by the Professional Services Contract).
 6. Construction Administration Phase.
- B. **Level of Detail:** All projects shall be designed and construction documents prepared as if the resulting project is to be formally bid through either an Invitation for Bids or Request for Proposals and managed by a Construction Manager. Additionally, construction documents shall be prepared to match bid packaging strategies recommended by the Construction Manager and approved by the Government. The consultant is cautioned that due to government restrictions on the use of brand names, federal construction documents typically require higher levels of detailing and specification than do projects for commercial work of comparable quality.
- C. **Required Reviews:** Meet with the AOC Project Manager and the Construction Manager at times and in the manner required by the Professional Services Contract and as specified in this Part.
1. **Pre-Submission Reviews:** At the completion of each design phase and prior to printing of review sets, coordinate informal pre-submission design reviews in the Associate A/E's office with the Construction Manager and the AOC Project Manager to verify that available drawings and documents meet submittal expectations for the design phase at hand and to develop a list of documents for reproduction and submission for review.
 2. **Construction Manager Reviews:** Meet with the Construction Manager at intervals provided for in the Professional Services contract to review all aspects of the project.
 - a. Obtain and respond to Construction Manager input on constructibility, availability of long-lead items, project schedule, availability of labor and materials, and budget. Obtain and respond to Construction Manager input regarding defects, ambiguities,

discrepancies, or lack of clarity in contract documents. Work with the Construction Manager to ensure that all anticipated general condition items and Option bid quantities are incorporated in the construction contracts.

- b. Provide copies of required cost estimates to the Construction Manager to facilitate the Construction Manager's review, interface with the Construction Manager to reconcile any discrepancies between the Associate A/E and Construction Manager estimates and adjust design to comply with AOC Project Manager direction.
- c. Provide the Construction Manager with the design schedule developed in consultation with the AOC to allow incorporation into the Construction Manager's Master Project Management Plan. Prepare for and participate in periodic meetings with the Construction Manager and the AOC Project Manager for the purpose of discussing procedures, progress, problems, scheduling, and other pertinent issues. Provide weekly status reports to the Construction Manager.
- d. The AOC Project Manager will resolve any areas of disagreement between Associate A/E and the Construction Manager, will secure Client approval of any issue that affects project scope, schedule, or budget, and will direct each party as to how to proceed in the next Phase. **G**

D. **Incorporation of Review Comments:** All review comments shall be incorporated into work subsequent to each submittal and *prior to commencement of the next phase*. All comments shall be responded to in writing to clearly state the action the Associate A/E will take in response to each comment. If the Associate A/E takes exception to a review comment, the issue shall be clearly presented so that the issue may be resolved by the AOC. Responses to AOC review comments shall be entered into the AOC-provided computer spreadsheets to enable consistent tracking of related comments throughout the life of the project. Clarify "Will Comply" responses with actions to be undertaken. Resolve all comments prior to making application for payment for each phase.(See Appendix 4A).

1. **Backcheck Sets:** Submission of backcheck sets verifying incorporation of AOC comments shall be limited to sheets or specification sections affected by those comments and to a single set of same for review by the AOC Project Manager. The 100% construction documents backcheck submission shall be a complete construction documents set.

4cm.2 **PROJECT STARTUP:**

- A. **Pre-Design Kick-Off Meeting:** As required by Part 3 and prior to commencement of the Design phase, the Associate A/E shall meet with the AOC Project Manager and review the Building Program, the Schedule, the Budget, the Team and administration responsibilities. **G**
- B. **Consultant Approach:** The Associate A/E shall examine the program, AOC standards and requirements and prepare a Project Execution Plan that summarizes the firm's approach to executing the work, identifies input required from major stakeholders, and enumerates the major design standards to be used and how they will be applied to the Project. **G**

- C. **Project Schedule:** Prepare a proposed project schedule and resource plan for the Project showing all required review milestones and personnel loading against design activities. Provide for all required review periods. The proposed Project Schedule shall conform to the delivery requirements stated in the Professional Services Agreement. The Associate A/E shall review the proposed Project Schedule with the AOC Project Manager and the Construction Manager to ensure that all work can be accomplished in accordance with available resources and within required constraints. Include each design phase, each required approval, procurement (bidding & award) phase, full construction phases, and commissioning activities. A standard Gant chart (bar-chart) is an acceptable format for presenting the activity time line. **G**
- a. *Review Schedule:* All Large Projects shall have their review periods coordinated with the AOC Master Design Review Schedule maintained by the AOC Project Information Center. Ascertain open time slots prior to finalizing project delivery schedules. Every agency project can not be reviewed at the same time. Adherence to Project Schedule will be monitored by the Construction Manager. **G**

4cm.3 BUILDING PROGRAM

- A. **Required Prior to Design:** Prior to commencement of the Schematic Design phase, the formal *Building Program*, based on the Initial Project Statement and approved by the Client, will be prepared. The *Building Program* will be developed provided to the Associate A/E, or:
1. **Associate A/E Responsibilities:** If specified within the Professional Services Contract, the Associate A/E shall prepare a formal *Building Program* in conformance with Part II, Project Programming. Note that programming services are recognized as Additional Services beyond the scope of the Basic Services contained within the standard Associate A/E Professional Services Contract. **G**
 2. **Site-Analysis Services:** If specified within the Professional Services Contract, the Associate A/E shall analyze the existing site for adequacy utility service, fire hydrant flow tests performed within the past 5 years, presence of existing underground obstructions or hazards, topographic features and drainage, relationship of site access points to transportation sources (both private and public), relationship of site features to surrounding buildings and natural features, and micro climatological systems. **G**
 3. **Existing Conditions Documentation:** If specified within the Professional Services Contract, the Associate A/E shall survey the existing facility, either field measure existing rooms and spaces and create drawings or validate AOC provided drawings of rooms and spaces. Document critical discrepancies and modify the drawings to accurately reflect existing conditions, and analyze existing structural, mechanical, electrical, and life safety systems and document each to the extent required for execution of the Project. **G**
 4. **Basis of Design Document:** Prior to commencing work, provide a Basis of Design outline that represents the Associate A/E's understanding of Program requirements, summarizing by system features and components to be provided in the submitted design. **G**
- B. **Preliminary Code Analysis:** The Associate A/E is responsible compliance of the design with Code requirements. If the Professional Service Contract requires the services of a Code

Consultant, coordinate that consultant's findings with all members of the design team. For all projects, at a minimum, the Preliminary Analysis shall define the following: **G**

1. Applicable Code and Edition, as identified by the AOC, applied to the analysis,
2. Use Group Classification (s) for the facility and major parts thereof,
3. Proposed or existing type of Construction Classification,
4. Accessibility regulations to be applied.
5. Mechanical code evaluation to address how ventilation and exhaust requirements will be achieved.
6. Electrical code evaluation to address how lighting levels and emergency power requirements will be achieved. How electrical equipment installation requirements will be addressed.
7. Life safety code evaluation to address egress, fire alarm and fire suppression systems and how they will be addressed. Include an evaluation of code mandated smoke control systems.
8. Equivalency and Options proposals to resolve code issues discerned while maintaining historic fabric of the facility.
9. Maintenance of Egress: Provide plans addressing maintenance of emergency egress around any construction site that impacts building egress paths. Provide a table of signage revisions and tabulated corrected egress loading per route.
10. **Preliminary HazMat Assessment:** Conduct field surveys as required to supplement any existing conditions documents forwarded by the AOC Project Manager. **G**
 - a. *Hazardous Material Identification:* Review existing asbestos and lead test results provided by the AOC. Perform additional testing for lead-based paint and asbestos-containing materials as necessary to determine the extent of hazardous materials to be encountered during the construction of the project. A certified inspector must be used to obtain the required number of bulk asbestos and/or lead-based paint samples in the areas affected by the project, and submit the samples to a certified laboratory for analysis. The asbestos samples must be analyzed using either polarized light microscopy (PLM) with dispersion staining (EPA Method 600/R93-116) or transmission electron microscopy (TEM) for non-friable organically bound bulk samples (NY ELAP Method 198.4). Provide a report that reflects both the reliance on past testing and the results of any additional analysis, and include quantities of the hazardous materials found.
 - b. *Waste Stream Samples:* To address EPA regulatory concerns, take a representative sample of the waste stream to be generated and perform Toxicity Characteristic Leaching Procedure (TCLP) testing (EPA Method 1311) to determine if the lead/heavy metals in the wastes should be managed and disposed of as hazardous waste; or determine through appropriate calculations that the lead/heavy metal content cannot exceed the TCLP limit for hazardous waste.
 - c. *Abatement:* Incorporate appropriate abatement, monitoring, and disposal procedures into the design documents.
 - d. *Hidden Hazards:* Incorporate standard language related to hidden hazards (see AOC Division One).

4cm.4 SCHEMATIC DESIGN

- A. **Schematic Design:** During this phase define the total project scope. Describe the project principally in two dimensional configurations against the requirements contained within the *Building Program*. The presented schematic design should demonstrate a range of design alternatives investigated for each discipline with each developed to an extent to clearly demonstrate why the system or design presented was chosen. The resulting scheme shall have areas, spaces, and relationships confirmed against *Building Program* requirements and all deviations identified and reconciled.
- B. **Pre-Submission Procedures:** Prior to production of the review sets, the AOC Project Manager and the Construction Manager shall meet with the Associate A/E to review one complete set of documents and verify that the intended submittal possesses the information required for the AOC's review process. **G**
- C. **Schematic Design Submissions:** The Schematic design submission shall contain the following:
1. **Design Commentary:** Provide narrative descriptions of various features and a listing of any differences between the submitted design and the *Building Program*. Discuss circulation and egress plans for all categories of occupant. Summarize features of the building envelope, major structural systems, principal interior finishes, historic considerations, mechanical systems, electrical systems, conveying systems, fire alarm/life safety systems, security and telecommunication systems. Detail unique features requiring specialized definition or proprietary or time critical solution that could impact project delivery. Clearly identify government furnished furniture, fixtures and equipment. **G**
 - a. Code Analysis: Update code analysis, listing compliance required occupancy, life safety, fire resistance, and structural adequacy. **G**
 - b. Options: Develop list of design options to ensure that the project may be kept within budget limitations. **G**
 2. **Space Studies:** Tabulations contained in a standard spreadsheet format containing at a minimum the following data or database fields: **G**
 - a. Title Block
 - b. Project Name
 - c. AOC Project Number
 - d. Gross Project Square feet
 - e. Program Space Name
 - f. Program Net Assignable Square Footage for each Space.
 - g. Schematic Space Name.
 - h. Schematic Net Assignable Square Footage for each Space.
 - i. Variance between Program and Schematic assignable areas.
 3. **Site Studies:** Provide a narrative describing the site, the planned access to the building, the relationship to surrounding buildings, future expansion potential, the availability of utilities

and services, the interaction with existing pedestrian and vehicular transportation systems, and any restrictions on use of the site. For projects affecting Congressional garages or surface parking, summarize the impact on space count, suggested alternative locations, and length of time that the parking will be affected. **G**

- a. *Drawings:* Provide site plans indicating site boundaries, limits of improvements, setbacks and easements, existing buildings and structures to be removed or retained, adjacent buildings that could impact the project, general topography and vegetation, and predominate drainage routes. Indicate extent of pedestrian/vehicular circulation and parking, and access routes to public transportation. Identify all existing on-site utility services and off-site utility services, including fire protection services. **G**
 - b. *Calculations:* Drainage and run-off the building will impact, parking counts. **G**
4. **Architecture:** Provide narrative discussion by system to address building massing, circulation and access to major spaces, justification for major materials and finishes to be used, planned methods/systems for exterior maintenance, and a list of options being proposed to control scope/cost. Address incorporation of all Government-provided furniture, fixtures, and equipment. **G**
- a. *Drawings:* As applicable to the project, provide the following at appropriate scales:
 - 1) *Floor Plans:* Single line floor plans, showing departmental areas and agencies, work areas, corridors, entrances, vertical transportation, and identifying each room or space. Provide overall dimensions; indicate how major mechanical/electrical components may be removed/replaced. **G**
 - 2) *Elevations:* For major building faces showing building massing, shadow lines, materials, fenestration, roof slopes, and relation to adjoining buildings. **G**
 - 3) *Building Sections:* Transverse or longitudinal building section showing floor-to-floor relationships, construction, and roof profiles. **G**
 - b. *Calculations:* Provide preliminary plumbing fixture counts, egress populations, and vertical transportation studies. **G**
5. **Structural Systems:** Provide a narrative discussion of conceptual framing and foundation system with comparison of alternate systems considered and reasons for rejection of each.
- a. *Drawings:* Provide drawings indicating planned framing systems with bay sizes, column locations, and expansion joints. **G**
 - b. *Calculations:* Identify all live, dead, seismic and wind design loads. **G**
6. **Mechanical Systems:** Provide a narrative discussion of the HVAC system general features, configuration, rationale for selection, and how it integrates with architectural building systems. For new facilities, explain Project interfaces with existing chilled water and steam sources, city water/sewer connections, and electrical utilities. Verify reliability/capacity of existing infrastructure. Include block loads based on area and use group. **G**

- a. *Plan Drawings:* Show equipment spaces for mechanical equipment, single-line distribution diagrams, and connection points to existing supply sources. **G**
 - b. *Plumbing:* Describe proposed special features of system and provide dimensioned sketch of major service entry and waste routes, distribution scheme. **G**
 - c. *Calculations:* Provide gross heating/cooling loads. **G**
7. **Electrical Systems:** Provide narrative discussion of the electrical design approach. Describe the proposed electrical system (normal and emergency) and anticipated loads. The narrative shall include the advantages/disadvantages to support the consultant's recommendations. Provide the following: **G**
- a. *Plan drawings:* Show the locations of new and existing electrical and telephone rooms/closets, security systems, and other spaces to meet the project requirements. Coordinate space requirements with architectural plans. **G**
 - b. *Riser Diagrams:* Single-line riser/distribution diagrams for standard/emergency system; show locations of telecommunication and security equipment closets. **G**
 - c. *Utility Capacity:* For new buildings with new electrical service, the consultant shall contact the local utility company as necessary and indicate the type of service available in the schematic design report. **G**
 - d. *Special Systems:* Describe in narrative form requirements for such items as conveying systems, UPS for file server, fire alarm, fire pumps, security, telephone and other systems. **G**
 - e. *Renovation & Alteration Narrative:* Provide a statement of impact of the new construction to the existing distribution system, include existing loads and projected loads. Base submission on a survey of existing conditions, including an evaluation of whether the existing services meet all code and safety requirements and have adequate capacity to serve all proposed new loads. Indicate if existing electrical or telecom rooms have sufficient room to meet the project requirements or if new closet spaces or rooms are required. **G**
 - 1) Describe methods to connect new loads/ and any upgrades required with normal and emergency systems, fire alarm systems, security, and telecommunication systems. **G**
 - 2) Propose in narrative form recommendations to improve or modify the existing electrical system for the project (for example, remove all tapped feeders and serve each panel separately from main distribution panel). **G**
 - 3) Describe in narrative form all phasing of the work, temporary power requirements, and any electrical services required to maintain operation of the renovated areas. Indicate any existing equipment to remain in service which is being served from the renovated area. **G**
 - f. *Calculations:* Provide unit load calculations for the project to verify utility service requirements. **G**
8. **Fire Protection:** Provide narrative discussion of the fire alarm and extinguishing systems planned for the facility. Identify occupancy classification (s), height and area calculations,

types of construction, and fire suppression requirements. Provide summary of hydrant flow test data for fire water connection that is no more than 1 year old.

- a. *Drawings:* Identify major routes of egress and any required areas of refuge. Show sources of fire protection water supplies, fire hydrant locations, and equipment spaces for fire protection systems. **G**
 - b. *New buildings or New fire service:* Contact the District of Columbia Water and Sanitation Department (or other jurisdictions as appropriate) to coordinate the requirement for the new service. **G**
9. **Security Systems:** Requirements for security systems will be forwarded to the Associate A/E on a case-by-case basis. **G**
 10. **Food Service Systems:** Describe in narrative format any plans for food service areas and define applicable codes and standards to be observed. **G**
 11. **Outline Specifications:** Identify principle materials, finishes, and building systems to be used. At this stage, brand names may be utilized to describe components in the interest of saving time. Format outline specification in either MasterFormat or Unifomat. Listing of proposed specification section titles absent product/material descriptions will not be accepted. See Appendix 6a. **G**
 12. **Cost Estimates:** Prepare cost estimates in accordance with ASTM E-1804, *Standard Practice for Performing and Reporting Cost Analysis During the Design Phase of a Project*, Paragraph 6.3, *Schematic Design Phase Estimate*. Prepare the Schematic estimate using Unifomat II, Level 3 (ASTM E-1557) based on schematic floor plans, outline specifications for principle materials, finishes, and building systems, and typical unit costs for structural, mechanical, and electrical systems. Reconcile cost estimates with the Construction Manager prior to submission. Include a design contingency approved by the Construction Manager to account for the preliminary nature of the design. Provide allowances for materials or systems not yet defined. (See Appendix 8b). **G**
- D. **Design Review Deliverables:** When the documents are approved for submission, provide the AOC with the full sets of documents for distribution to reviewing offices. Allow a minimum of 3 work days for internal distribution by AOC staff prior to the Kick-Off review conference.
1. Provide a minimum of eight (8) sets (or the number enumerated in the Professional Services Contract) of unmounted drawings reduced to half size plots. **G**
 2. Provide one set of full-size schematic architectural, mechanical, electrical and plumbing drawings mounted on foam board. **G**
 3. Provide eight (8) sets (or the number enumerated in the Professional Services Contract) sets of calculations, specifications, and cost estimates bound into 8-1/2" x 11" brochures. **G**
 4. Deliver required databases on standard *MS Windows NT* or *XP* formatted 3-1/2" floppy, a CD-ROM, or ZIP disks. **G**
- E. **Kick-Off Review Conference:** The Associate A/E shall conduct a formal, technical "overview" presentation to the AOC Project Team and the Construction Manager following the initial 3-day AOC document distribution period. **G**

- F. **AOC Discipline Review Conference:** The Associate A/E shall allow a minimum of 7 calendar days for AOC and Construction Manager review following the Kick-Off review conference and then meet with individual design discipline teams to fully discuss each discipline's work. **G**
- G. **Wrap-Up Review Conference:** A minimum of 7 calendar days after the Discipline Review Conference, the Associate A/E shall meet with the AOC and the Construction Manager to discuss and clarify preliminary comments prior to comment consolidation and delivery to the Associate A/E. Review comments will be forwarded to the Associate A/E using the standard AOC spreadsheet format. The Associate A/E shall respond to comments within one week. **G**
- H. **Formal Presentations & "On-Board" Reviews:** The Associate A/E and the Construction Manager shall prepare a formal presentation of the Schematic Design to both the Client and required Congressional oversight committees. Such presentations shall include large scale mounted plots of architectural floor plans that clearly explain the design response to Building Program, the compliance to the Master Project Management Plan, and evolving site logistics/constructability issues. As appropriate, supplement the mounted plans with diagrammatic images and space/area charts or tables that summarize adherence to requirements. The Associate A/E should plan on having the lead design professional from each major discipline in attendance at these presentations to answer questions. The Associate A/E shall prepare for 2 formal presentations. **G**
1. **"Rendering:"** Provide a three-dimensional color rendering or computer model of the major exterior views of the project, including site adjacencies. **G**
2. **Mass Model:** If provided in the Professional Services Contract, provide a basic massing model to explain the project's relationship to surrounding areas and buildings. **G**

4cm.5 DESIGN DEVELOPMENT

- A. **Design Development:** Completely define the project design during this phase. Refine schematic designs to incorporate revisions to meet AOC comments provided during the Schematic review. Design **stops** at the end of this phase. Project conditions unresolved during design development are difficult to coordinate during production of construction documents.
1. **Bid or Proposal Options:** Identify potential bid or proposal options at this phase to allow approval by the AOC and proper incorporation and coordination in the construction documents. **G**
2. **Proprietary Items:** If proprietary items will be required within the project design, this submission should disclose those items, provide product data, list their salient characteristics and the reasons why they must be used, and recommended methods for obtaining substitutes should they not be available. The design should not proceed with a concept if that concept can hold the project "hostage" to its availability, either in the new facility or in its subsequent maintenance and replacement. **G**
- B. **Pre-Submission Procedures:** Prior to production of the review sets, the AOC Project Manager and the Construction Manager shall meet with the Associate A/E to review one

complete set of documents and verify that the intended submittal possesses the information required for the AOC's review process. **G**

C. Design Development Submission: The Design Development submission shall contain the following:

1. **Design Commentary:** Descriptions of various features, by system, and a listing of any differences (exceptions) between the *Building Program*, the Schematic Phase, and the Design Development Phase. Provide a complete Code Analysis at this Phase, listing compliance required occupancy, life safety, fire resistance, and structural adequacy. **G**
2. **Space Studies:** Update area tabulations contained in the spreadsheet developed during the Schematic Phase containing at a minimum the following data fields: **G**
 - a-f. Fields as listed in the Schematic Phase Table.
 - g. Design Development Space Name.
 - h. Design Development Net Assignable Square Footage for each Space.
 - i. Variance between Program and Design Development assignable areas.
3. **Site Plans:** Provide narrative discussion of site circulation and transportation concept, utility distribution scheme, drainage concept, and landscape design concept. Provide justification for plant selection and proposed landscape maintenance/watering plans. Identify borrow/disposal sites and any required permits. **G**
 - a. **Drawings:** Further develop drawings to provide, at a minimum, the following:
 - 1) **Site Layout Plans:** Further develop to show all roads and walks (indicating pavement type), accessible routes from parking and public streets to main facility entrance, fire apparatus and fire lanes, and site furnishings. Indicate limits of improvements adjacent buildings that could impact the project. **G**
 - 2) **Site Utilities Plans:** Show existing and proposed sizes and locations/tie-ins of all utilities, including domestic and fire protection water lines, fire hydrants, sanitary sewer lines, and steam and chilled water tunnels/lines. **G**
 - 3) **Landscape Design Plan:** Define total scope of landscaping, size/location of major existing trees and features scheduled to remain, proposed planting beds, and range of proposed irrigation systems as applicable. **G**
 - b. **Calculations:** Provide site and building storm drainage calculations, parking calculations, and dewatering calculations, as applicable. **G**
4. **Architecture:** Further develop narrative discussion by system to address refinements of building massing, circulation and access to major spaces, justification for major materials and finishes to be used, justifications for any project-dependent proprietary products, planned methods/systems for exterior maintenance, and a list of options being proposed to control scope/cost. Address incorporation of all Government-provided furniture, fixtures, and equipment. **G**

- a. *Drawings:* Further develop Schematic drawings and provide at a minimum:
 - 1) *Floor Plans:* Double line plans for each floor and typical floor at appropriate scales showing rooms, departmental areas and adjacencies, and identifying each room or space. Show all vertical pipe and duct spaces, columns, and other principal features. Show special equipment areas at enlarged scale. **G**
 - 2) *Elevations:* Elevations of each exterior face indicating entrances, window arrangements, doors, etc., exterior materials with major vertical/horizontal joints, roof levels, and dimensions to floor/roof lines. **G**
 - 3) *Building Sections:* Longitudinal and cross sections through the full building showing floor-to-floor and other critical dimensions, floor construction and interstitial spaces, raised floor areas, typical ceiling heights, stairs and elevators penthouses, and roof construction. **G**
 - 4) *Typical Wall Sections:* Develop a minimum of one wall section that represents conditions at a typical point on the exterior building envelope that clearly indicates insulation, vapor retarders, and glazing. **G**
 - 5) *Schedules:* Include a preliminary schedule of floor, wall, and ceiling finishes proposed for typical rooms and spaces. Clearly indicate any Government furnished or installed equipment in schedules. **G**
 - 6) *Roof Plans:* Provide plan, at same scale as floor plans, indicating roof high points, slopes, valleys, drain locations and any penthouses. **G**
 - b. *Calculations:* As applicable, provide exterior envelop dew point calculations, acoustical calculations, and toilet fixture counts. **G**
5. **Structural Systems:** Refine narrative discussion of selected framing and foundation system. Clearly identify design criteria employed. List all live, dead, and wind loads utilized. Include soils investigation and materials report. **G**
- a. *Drawings:* Provide framing plans, at the same scale as the architectural floor plans, and key details. **G**
 - b. *Calculations:* Provide gravity load, lateral load, foundation and vibration calculations; and evidence the design is not subject to progressive collapse. For all computer generated results, submit a model of the input data and program material to allow understanding of the output. **G**
6. **Mechanical Systems:** Provide a narrative of the HVAC system with discussion of general features, configuration, and how it integrates with architectural building systems. Complete definition of HVAC equipment. As appropriate to the project, discuss recommended energy sources and means of energy conservation. Provide notation of outdoor summer and winter design conditions, and indoor design conditions and special requirements, ventilation requirements, indoor relative humidity design conditions and special requirements, and building block heating and cooling loads. **G**
- a. *Drawings:* Further develop Schematic drawings to provide the following:

- 1) *Mechanical Floor Plans:* Plans, at the same scale as the architectural floor plans, that shows the main zones and distribution systems for both ducts and mechanical piping. Define all required mechanical spaces. For alterations, clearly show connections points to existing systems. System schematics and flow diagrams. **G**
- 2) *Plumbing Floor Plan:* Provide diagrammatic floor plan for each floor, at the same scale as the architectural floor plans, that shows the main supply and soil routing for domestic water systems. Discuss specialized areas as appropriate. **G**
- a. *Calculations:* Provide computerized building energy analysis. Report energy broken into five categories: heating, air conditioning, lighting, domestic hot water, and other (summarize items included in "other"). Summarize utility consumption in a schedule that addresses the following (as applicable): **G**
 - 1) Electricity KVA
 - 2) Steam lbs/hr
 - 3) Chilled water gpm and Tons
 - 4) Domestic water gpm
 - 5) Fire Flow gpm
 - 6) Irrigation gpm
 - 7) Sanitary gpm
 - 8) Storm Total impervious Area, sq.ft. or acres
7. *Electrical Systems:* Provide updated narrative discussion of the design, including basic assumptions and points of interconnection with existing electrical and fire alarm systems. For renovations or alteration work, update statement from the Schematic phase of the impact of the new construction to any existing distribution systems, telephone, and signal inter-building systems (F/A, CCTV, security, clock systems, legislative call system, etc.) associated with the new work. Describe work phasing plan. **G**
 - a. *Drawings:* Further develop Schematic drawings to provide the following:
 - 1) *Floor Plans:* Indicate location and sizes of electrical and emergency equipment and include room titles and area functions. Reference electrical plans to the architectural floor plans. Provide separate distribution plans for lighting, power, and telecommunication layouts. **G**
 - 2) *Electrical Rooms:* Provide minimum 1/8" scale plans of all electrical rooms indicating the adequacy of the new electrical equipment layout. **G**
 - 3) *Single-Line Diagrams:* Submit a clear enhanced single-line diagram of the proposed electrical system (normal and emergency). Include in the diagram low voltage panelboards, branch circuit panels and representative methods of feeding 277/480 volt, (if required) and 120/208 volt normal and emergency panels. Include preliminary design of proposed lighting and lighting controls, dimmers, location of cove lighting, etc. Describe the methods and assumptions used for lighting foot candle level calculations. **G**

- 4) *Riser Diagrams:* Submit single-line riser diagrams for fire alarm systems and empty conduit raceway system riser for security and telecommunication systems. **G**
- 5) *Materials:* Provide lighting fixture product data (cuts), and cuts of any other major electrical components which will require AOC approval. **G**
- b. *Calculations:* Submit preliminary load calculations for both normal and emergency power distribution systems. Break down calculations into lighting, receptacles and power. Include current demand load and projected load of new construction. For alterations and additions, indicate if the existing panels meet the new loads and available short circuit rating. **G**
- 8. **Fire Protection:** Refine narrative from Schematic Phase to clearly define occupancy classifications, ratings of structural components, classification of interior finishes, and location of fire-rated walls and partitions. Clearly identify any special hazard designs if applicable (smoke evacuation, etc.). Identify code sections used and review the building for compliance with life safety codes and discuss the design's impact on security requirements. Highlight any requirements for use of code equivalencies or exceptions. Provide egress information with tabular listing of number and type of each exit, loads at each exit, and travel distances with path widths and capacities noted. Indicate planned configuration of sprinkler system, types of sprinklers to be used and the minimum required residual pressure required for each type, and concepts of fire notification and alarming **G**
 - a. *Fire Protection Drawings:* Provide fire protection plans for each floor, at same the scale as the architectural floor plans, that show fire alarm zones, sprinkler zones and associated occupancy hazard, smoke zones, equipment spaces for fire protection systems, standpipe and locations, sprinkler main sizes, zone valves, and flow switches, locations and ratings of fire walls and smoke barriers. Provide cover sheet listing codes employed, edition, and major sections. **G**
 - b. *Calculations:* Provide NFPA occupant loads and area for each space and full egress calculations, sprinkler hydraulic calculations with pressure losses associated with all components and applied to most distant sprinkler, and notation of software used. **G**
- 9. **Security Systems:** See Schematic Phase. **G**
- 10. **Food Service Systems:** Prepare full layouts of food preparation areas and food service areas, noting required electrical and mechanical services. **G**
- 11. **Outline Specifications Submission:** Refine outline specifications, using *MasterFormat*, that indicate materials and types of construction which may at this point include brand names to establish quality and function (see [Part 6](#) and Appendix 6b for examples). Provide short-form sections for key, project determinate products or systems. Include a description of each HVAC, plumbing, electrical, and fire protection system concept. **G**
- 12. **Cost Estimates Submission:** Prepare cost estimates in accordance with ASTM E-1804, *Standard Practice for Performing and Reporting Cost Analysis During the Design Phase of a Project*, Paragraph 6.4, *Design Development Phase Estimate*. Prepare the Design Development estimate using Uniformat II, Level 3 (ASTM E-1557) based on Design

Development floor plans, specifications for all materials, finishes, and building systems, and typical unit costs for structural, mechanical, and electrical systems. Reconcile cost estimates with the Construction Manager prior to submission. Reduce the design contingency from that used during Schematic Phase. Provide allowances for materials or systems not yet defined. (See Appendix 8c). **G**

- D. **Design Review Deliverables:** When documents are approved for submission, provide the AOC with the full sets of documents for distribution to reviewing offices. Allow a minimum of 3 work days for internal distribution by AOC staff prior to the required Kick-Off review conference.
1. Provide a minimum of eight (8) sets (or the number enumerated in the Professional Services Contract) of unmounted drawings reduced to half size plots. **G**
 2. Provide one set of full-size drawings (plans and elevations by discipline) mounted on foam board. **G**
 3. Provide eight (8) sets (or the number enumerated in the Professional Services Contract) sets of calculations, specifications, and cost estimates bound into 8-1/2" x 11" brochures. **G**
 4. Deliver required databases on standard *MS Windows NT* or *XP* formatted 3-1/2" floppy, a CD-ROM, or ZIP disks. **G**
- E. **Kick-Off Review Conference:** The Associate A/E shall conduct a formal, technical “overview” presentation to the AOC Project Team and the Construction Manager following the initial 3-day AOC document distribution period. **G**
- F. **AOC Discipline Review Conference:** The Associate A/E shall allow a minimum of 7 calendar days for AOC and Construction Manager review following the Kick-Off review conference and then meet with individual design discipline teams to fully discuss each discipline’s work. **G**
- G. **Wrap-Up Review Conference:** A minimum of 7 calendar days after the Discipline Review Conference, the Associate A/E shall meet with the AOC and the Construction Manager to discuss and clarify preliminary comments prior to comment consolidation and delivery to the Associate A/E. Review comments will be forwarded to the Associate A/E using the standard AOC spreadsheet format. The Associate A/E shall respond to comments within 7 calendar days. Do not proceed with next design phase until all comments have been reconciled. **G**
- H. **Back-Check:** Resolve and document responses to all agency comments. Obtain approval to responses prior to proceeding with the next phase. Incorporate required revisions to drawing files prior to proceeding to next phase to ensure that all participants are working from the same coordinated design. Submit revised record set to the AOC Project Manager. *Design should effectively end now!* **G**
- I. **Formal Presentations & “On-Board Reviews”:** The Associate A/E shall prepare a formal presentation of the Design Development Design to both the Client, required Congressional oversight committees, and such public presentations as may be identified by the AOC. Such presentations shall include large scale mounted plots of architectural floor plans that clearly

explain the design response to Building Program. As appropriate, supplement the mounted plans with diagrammatic images and space/area charts or tables that summarize adherence to requirements. The Associate A/E should plan on having the lead design professional from each major discipline in attendance at these presentations to answer questions. If provided in the Professional Services Contract, provide a presentation model to explain the project's relationship to surrounding areas and buildings. **G**

1. The Associate A/E shall prepare for the number of formal presentations specified in the Professional Services Contract. **G**

4cm.6 **CONSTRUCTION DOCUMENTS - 50% PROGRESS SUBMISSION**

- A. **Construction Documents - 50% Completion:** A submission of the draft contract documents and supportive material which clearly show the progress of the project to the 50% construction document stage. Include review comments and responses from the preceding phase. Any changes necessitated by development of the construction documents shall be clearly highlighted to allow for review and approval.
 1. **Space Studies:** Update area tabulations entered in the space spreadsheet during earlier design phases. After finalizing the space layouts, updates of the spreadsheet may be discontinued provided data remains unchanged during subsequent submissions. **G**
 2. **Room Name/Numbers:** Begin assigning final AOC approved room names and numbers, utilizing the numbering system provided by the AOC. **G**
 3. **Furniture, Fixtures, and Equipment (FF&E):** As applicable, clearly indicate coordination with Government furnished FF&E. **G**
- B. **Pre-Submission Procedures:** Prior to the Associate A/E's production of the review sets, the Project Manager and the Construction Manager shall meet with the Associate A/E to review one complete set of documents and verify that the intended submittal possesses the information required for the AOC's review process. **G**
- C. **Construction Documents:** Provide a title sheet and a complete drawing list for the planned construction document set. Submit the following for the 50% progress review: **G**
 1. **Site Plans:** Provide narrative discussing design revisions made subsequent to Design Development. Commence preparation of final construction drawings and specifications.
 - a. **Drawings:** Develop drawings to provide final configurations, at a minimum, for: existing and new topography and utilities, public roads and walks, access roads, extent of parking, relationships to other buildings, final *limits of construction*, and site furnishings. **G**
 - b. **Calculations:** Provide grading and water run-off calculations, as appropriate. **G**

2. **Architectural Drawings and Samples:** Provide narrative discussing revisions made to the design subsequent to Design Development. Commence preparation of final construction drawings and submit required samples. **G**
 - a. **Drawings:** Further develop drawings to provide, at a minimum, the following:
 - 1) **Floor Plans:** Provide Double Line Floor Plans at appropriate scales showing rooms, departmental areas and adjacencies, identifying each room or space, and showing all major built-in features. Typical conditions that repeat or conditions of design complexity shall be fully developed. **G**
 - 2) **Roof Plans:** Provide roof plans at same scale as floor plans, indicating roofing high points, slopes, valleys, expansion joints, drains locations, plumbing vents, roof equipment, roof walkways, and penthouses. **G**
 - 3) **Elevations:** Elevations of each exterior face indicating entrances, window arrangements, doors, etc., exterior materials with major vertical/horizontal joints, roof levels, and dimensions to floor/roof lines. **G**
 - 4) **Building Sections:** Longitudinal and cross sections through the full building (at scales consistent with the floor plan drawings), to illustrate the relationships between floors and spaces and their interfaces with structural systems. **G**
 - 5) **Typical Wall Sections:** Provide wall sections at an appropriate scale, that represent conditions at all typical points on the exterior building envelope and at all special conditions. **G**
 - 6) **Details:** Provide detail drawings for all architectural and structural interfaces between members and at openings, terminations, and transitions as required to fully explain the construction proposed and specifically all “design dependent” details upon which major design decisions are based. **G**
 - 7) **Schedules:** Provide schedules for each generic type of door, window, hardware set, major piece of equipment, and finish for all room and space types. **G**
 - 8) **Samples:** Provide material and color samples as appropriate for critical and typical areas of the architectural design. **G**
 - 9) **Demolition Plans:** For renovation and modernization projects, provide demolition plans at scales consistent with the floor plan drawings. **G**
3. **Structural Systems:** Provide updated discussion of structural system, noting any changes from the Design Development submission. Reconcile foundation plans to soils investigation reports. Provide final soils and materials investigation reports. **G**
 - a. **Drawings:** Provide, at a minimum, the following:
 - 1) **Foundation Plans:** Provide initial foundation plans, completed to at least 50% completion, plotted at the same scale as the architectural floor plans. **G**
 - 2) **Structural Framing Plans:** Provide initial framing plans, fully dimensioned, completed to at least 50% completion, plotted at the same scale as the architectural floor plans. Provide live loads for all areas (or classes of areas) on the structural plans. **G**

- 3) *Details:* Provide fully developed details for principle structural connections and interfaces with architectural systems. **G**
- 4) *Demolition Plans:* As applicable, provide demolition plans. **G**
- 5) *Schedules:* Complete structural schedules for major systems. **G**
- b. *Calculations:* Provide final structural calculations for major systems and necessary material data to support framing plans designed. Include all loads, supports for non-structural elements (including mechanical and electrical equipment), and any blast analysis (as required by the Professional Services Contract). **G**
- 4. **Mechanical Systems:** Provide narrative description of HVAC system. Provide all equipment and system data justified by indicating the basis for the data.
 - a. *Drawings:* Provide drawings, as appropriate, for the following:
 - 1) *Demolition Plans:* Provide for renovation and modernization projects. **G**
 - 2) *Mechanical Floor Plans:* Provide resolved floor plans for each floor, at the same scale as the architectural floor plans, that shows the main distribution systems for both ducts and mechanical piping. All dampers, both fire dampers and volume control dampers, must be shown. **G**
 - 3) *Equipment Room Plans:* Provide large scale equipment room plans where required to show adequate clearances and detail. **G**
 - 4) *Plumbing Floor Plans:* Provide a resolved floor plan at same scale as architectural floor plans, that shows the main systems (cold water, hot water, hot water recirculating, and all major equipment). Diagram major risers and provide design calculations. Discuss specialized areas as appropriate. Show routing of sanitary, waste and storm drainage piping systems. Provide 1/4" scale toilet room piping layouts, riser diagrams and design calculations. All valves must be shown & labeled. Indicate locations where temperature, pressure and flow gauges are required. **G**
 - 5) *Schedules:* Complete mechanical schedules for all major equipment. **G**
 - b. *Calculations:* Mechanical calculations shall be complete including data necessary to justify equipment shown in submitted drawings. Provide calculations including block loads for heating and cooling, heat loss calculations for building envelop, room load and supply air calculations, and flow and head calculations for pumping systems. **G**
 - 1) *Design Conditions:* Verify notation of outdoor summer and winter design conditions, indoor design conditions and special requirements, indoor relative humidity design conditions and special requirements, room heating and cooling loads, building block cooling loads, system loads, and psychometric calculations. Include the basis and amount of heat gain for people, lighting, and equipment, all building envelope "U" values, and outside air used for each system. When infiltration loads exist, show basis and calculations. **G**

- 2) *Equipment Selection Data:* Provide air balance summary tabulating supply, return, outside air, and exhaust air CFM for each system. Provide water balance summary tabulating GPM of water to each primary and secondary piece of equipment for each pump, each system, each chiller and boiler. **G**
 - 3) *Terminal Loads:* Provide a summary of heating and cooling requirements met by each terminal device (VAV box, fan coil unit, etc.), each secondary piece of equipment (air handling unit), and each primary piece of equipment (chiller or boiler). Include control system diagrams with sequence of operation. **G**
5. **Electrical Systems:** Provide narrative discussion of power systems, including estimated loads and single line diagram indicating sizes of transformers, major distribution equipment, and emergency generators or UPS units. Include cuts of proposed light fixtures. **G**
- a. *Drawings:* Provide, at a minimum, the following:
 - 1) *Lighting Floor Plans:* Submit plans referenced to architectural plans showing location of all fixtures, switches, and associated lighting control equipment. Indicate locations for emergency lighting. **G**
 - 2) *Power Plans:* Submit power plans showing locations of all panels, receptacles, motor control centers, major feeders to mechanical equipment, and required spaces for conduit chases and clearances required. **G**
 - 3) *Distribution:* Space requirements and layouts of major electrical distribution equipment and rooms. Show location of all major components of primary and secondary distribution system including normal and emergency panels, transformers and all other major items drawn to scale. Indicate on the 1/4" scale plan, the electrical equipment to be installed in each closet. **G**
 - a) *Branch Wiring:* Show routing and methods of conduit routing through any historic or special areas. **G**
 - 4) *Service:* Show routing of all underground feeders and services. **G**
 - 5) *Special Systems:* Show on plans location of Fire Alarm, CCTV, Intercom and other Signal requirements. Provide riser diagrams. Indicate fire alarm devices single-line riser diagram, and methods to connect to existing system. **G**
 - 6) *Telecommunication and Security:* Show locations of telecommunication and security equipment in closets and single-line riser/distribution diagrams. **G**
 - 7) *Alteration Projects:* Provide demolition and phasing plans to indicate the complete electrical work in all areas to be renovated. Use Standard Symbols for demolition and rewiring. **G**
 - b. *Calculations:* Update system load calculations, short circuit studies, voltage and power calculations. Submit lighting and power calculations, voltage drop and available short circuit ratings for electrical panels. **G**

6. **Fire Protection:** Provide a updated narrative discussion of the design of egress system, including doors to be equipped with panic hardware, identification and location of fire-resistive assemblies, including walls, partitions, and floors. If equivalencies are proposed for renovation or alteration of existing space, fully define proposed equivalent designs and included appropriate calculations or fire models to support the proposal. **G**
 - a. **Fire Protection Drawings:** Provide fire protection plans indicating location of fire service mains, fire hydrant locations, water supply source, general routing of standpipes and sprinkler piping showing valves and other system components, including pipe sizes, and fire pump location. Indicate locations for emergency and exit lighting. Indicate final locations of all alarm strobes, annunciation panels and sub-panels. Indicate typical coordination of sprinklers with reflected ceilings. Include details of sprinkler riser, fire pump, and plan of fire protection room. **G**
 - b. **Riser Diagram:** Provide riser diagrams to include all piping sizes and components starting at entry to building. Include backflow preventor, valves, alarm valves, zone valves, tamper switches, flow switches, drain connections, fire pump, jockey pump, check valves, relief valves, etc. **G**
 - c. **Calculations:** Refine final fire protection analysis and supporting data showing calculations used and tabulated data showing water flow requirements to the standpipe(s) and sprinkler systems. Provide design of and calculations for the smoke exhaust systems. Submit all calculations required by appropriate NFPA sections and their associated appendices, except where made more stringent by the AOC. **G**
 7. **Food Service Systems:** Meet with the AOC Sanitarian and review plans of food preparation areas and food service areas. **G**
 8. **Project Specifications:** Begin conversion of outline specification to final formats. Develop sections specifying special design or procurement needs to final formats and detail in order to substantiate key design decisions. Submit drafts using “striked-out” masters or annotated copies of office masters that clearly show data retained and deleted. As applicable, specifications shall be based on AOC Guide specifications. References to proprietary brand names shall be eliminated at this phase. **G**
 9. **Cost Estimates:** Prepare cost estimates in accordance with ASTM E-1804, *Standard Practice for Performing and Reporting Cost Analysis During the Design Phase of a Project*, Paragraph 6.4, *Design Development Phase Estimate*. Prepare the Construction Documents Phase estimate using Unifomat II, Level 3 (ASTM E-1557) based on Construction Documents Phase floor plans, specifications for all materials, finishes, and building systems, and typical unit costs for structural, mechanical, and electrical systems. Update any cost estimate furnished under the previous stage clearly identifying any modifications to previous submittals. Indicate how cost estimates that are out of range will be brought into conformance with budget requirements. Reconcile cost estimates with the Construction Manager prior to submission. Reduce design contingencies as specified in Part 8. See Appendix 8d. **G**
- D. **Design Review Deliverables:** When the documents are approved for submission, the Associate A/E shall provide the AOC with the full sets of documents for distribution to reviewing offices.

Allow a minimum of 3 working days for internal distribution by AOC staff prior to the required review conference.

1. Provide a minimum of eight (8) sets (or the number enumerated in the Professional Services Contract) of unmounted drawings reduced to half size plots. **G**
 2. Provide eight (8) sets (or the number enumerated in the Professional Services Contract) of calculations, specifications, and cost estimates bound into 8-1/2" x 11" brochures. **G**
 3. Deliver required databases on standard *MS Windows NT or XP* formatted 3-1/2" floppy, a CD-ROM, or ZIP disks. **G**
- E. **Kick-Off Review Conference:** The Associate A/E shall conduct a formal, technical "overview" presentation to the AOC Project Team and the Construction Manager following the initial 3-day AOC document distribution period. **G**
- F. **AOC Discipline Review Conference:** The Associate A/E shall allow a minimum of 7 calendar days for AOC and Construction Manager review following the Kick-Off review conference and then meet with individual design discipline teams to fully discuss each discipline's work. **G**
- G. **Wrap-Up Review Conference:** A minimum of 7 calendar days after the Discipline Review Conference, the Associate A/E shall meet with the AOC and the Construction Manager to discuss and clarify preliminary comments prior to comment consolidation and delivery to the Associate A/E. Review comments will be forwarded to the Associate A/E using the standard AOC spreadsheet format. The Associate A/E shall respond to comments within 7 calendar days. Do not proceed with next design phase until all comments have been reconciled. **G**

4cm.7 CONSTRUCTION DOCUMENTS (100%) FINAL SUBMISSION

- A. **Construction Documents - 100% Completion:** Complete construction documents preparation during this phase. Refine documents to incorporate revisions to meet AOC comments provided during the previous stage. Provide a final updating of the following:
1. **Design Commentary:** Descriptions of various features and a listing of any differences between the Building Program and the final design. Provide a final Code Analysis at this Phase, listing compliance required occupancy, life safety, fire resistance, and structural adequacy. **G**
 2. **Space Studies:** Update area tabulations contained in the spreadsheet developed during the Schematic Phase containing at a minimum the following data fields: **G**
 - a-f. Fields as listed in the Schematic Phase Table.
 - g. Final Space Space Name.
 - h. Final Net Assignable Square Footage for each Space.
 - i. Variance between Program and 100% Construction Documents assignable areas.
- B. **Pre-Submission Procedures:** A conference will be held to review the 100% Construction Documents Phase Documents. Prior to the Associate A/E's production of the review sets, the Project Manager and the Construction Manager shall meet with the Associate A/E to review one

complete set of documents and verify that the intended submittal possesses the information required for the AOC's review process. In addition, provide: **G**

1. **Cost Estimate Draft Submission:** Submit for review a draft construction cost estimate prepared in accordance with ASTM E-1804, *Standard Practice for Performing and Reporting Cost Analysis During the Design Phase of a Project*, Paragraph 6.5, *Construction Document Phase Estimate*. Prepare the estimate using Unifomat II, Level 4 (ASTME-1557) based on 100% construction document floor plans, specifications for all materials, finishes, and building, mechanical, and electrical systems. Include detail reports with full crew resource loading. Remove all design contingency. Perform value engineering analysis as required to ensure bidding within funding limitations and to assist in definition of any necessary Bid Options. See Appendix 8d. **G**

C. 100% Construction Documents:

1. **Site Plans:** Site plan developed to completion state with all existing and new topography and utilities, public roads and walks, access roads, extent of parking, and relationships to other buildings fully resolved and awaiting final approval. **G**
2. **Architectural, Structural, Mechanical, Electrical, and Fire Protection drawings, and Samples:** The complete set of construction documents, fully resolved and only awaiting final approval of the AOC. **G**
3. **Final Calculations:** Provide final calculations for major systems and necessary material data to support all equipment, materials, and systems used in the final construction documents. **G**
4. **Project Specifications:** 100% of the sections complete, printed in final format complete with applicable project number and title on every page. **G**
5. **Cost Estimates Submission:** Update the draft submitted above and incorporate AOC review comments. Final cost estimate submissions shall provide an estimate for each base bid, option (alternate), and unit price. **G**

D. Design Review Deliverables: When the documents are approved for submission, the Associate A/E shall provide the AOC with full sets of documents for distribution to reviewing offices. Allow a minimum of 3 working days for internal distribution by AOC staff prior to the required review conference.

1. Provide a minimum of 8 sets (or the number enumerated in the Professional Services Contract) of unmounted drawings reduced to half size plots. **G**
2. Provide 8 sets (or the number enumerated in the Professional Services Contract) of calculations, specifications, and cost estimates bound into 8-1/2" x 11" brochures. **G**
3. Deliver required spreadsheets on standard 3-1/2" *MS Windows NT or XP* formatted floppy disks. **G**

E. Kick-Off Review Conference: The Associate A/E shall conduct a formal, technical "overview" presentation to the AOC Project Team and the Construction Manager following the initial 3-day AOC document distribution period. **G**

- F. **AOC Discipline Review Conference:** The Associate A/E shall allow a minimum of 7 calendar days for AOC and Construction Manager review following the Kick-Off review conference and then meet with individual design discipline teams to fully discuss each discipline's work. **G**
- G. **Wrap-Up Review Conference:** A minimum of 7 calendar days after the Discipline Review Conference, the Associate A/E shall meet with the AOC and the Construction Manager to discuss and clarify preliminary comments prior to comment consolidation and delivery to the Associate A/E. Review comments will be forwarded to the Associate A/E using the standard AOC spreadsheet format. Final comment log will be used as the basis for final resolution of backcheck comments. **G**

4cm.8 CONSTRUCTION DOCUMENTS - BACKCHECK SUBMISSION

- A. **Construction Documents - Final:** Correct 100% construction documents to incorporate revisions to comply with final AOC review comments. Submit final comment log with all comments resolved. **G**
- B. **Construction Documents - Drawings:** The complete set of construction documents, fully resolved and only awaiting final approval and reproduction by the AOC. **G**
- C. **Final Engineering Calculations:** Provide final calculations for major systems and necessary material data to support all equipment, materials, and systems used in the final construction documents. **G**
- D. **Project Specifications:** 100% of the sections complete, printed in final format complete with applicable project number and title on every page. **G**
- E. **Cost Estimates Submission:** Update final cost estimate to reflect Backcheck comments. **G**
- F. **Documents Review and Final Deliverables:** Submit final deliverables:
 - 1. Provide a one complete set of polyester reproducible, plotted at full-size, ready for final reproduction and bidding and a minimum of eight (8) bound full-size and eight (8) half-size sets (or the number enumerated in the Professional Services Contract) of drawings. **G**
 - 2. Provide eight (8) sets (or the number enumerated in the Professional Services Contract) of calculations, and cost estimates bound into 8-1/2" x 11" brochures. **G**
 - 3. Provide one camera-ready, unbound copy original of the Project Manual and five (5) bound copies. **G**
 - 4. Deliver required databases on standard *MS Windows NT or XP* formatted 3-1/2" floppy, a CD-ROM, or ZIP disks. Deliver other required deliverables in accordance with applicable Parts of this *A/E Design Manual*. **G**

4cm.9 PROCUREMENT PHASE

- A. **General:** Large projects will typically be prepared for formal bidding by either Invitation for Bids (IFBs) or Request for Proposals (RFPs). The document preparation is similar for each with

- the variance between them resting principally with the Bid Schedules and Options rankings. The Associate A/E shall cooperate fully with the Construction Manager in the final preparation of the Procurement package, in Bidder's Site Visits and Meetings, and the preparation of Addenda.
- B. **Preparation of Procurement Documents:** The Associate A/E shall prepare the construction document sets for reproduction by the AOC. The Associate A/E shall cooperate with the Construction Manager to verify the accuracy of the lists/indexes of drawings, Project Manuals, contract time, and determinations of appropriate sums for liquidated damages. Provide full-size camera-ready reproducibles of all drawings and a camera-ready copy of the Project Manual. Full requirements for Lists of Submittals, etc., are listed in Part 6, the Project Manual. In addition, submit the following to the AOC Project Manager:
1. **Options:** Any Options (Alternates) as developed in coordination with the Construction Manager and as approved by the AOC Project Manager, numbered in sequence of preferred acceptance, and fully described as to scope. **G**
 2. **For RFPs:** Coordinate the preparation of suggested evaluation criteria for prospective Contractors with the Construction Manager. **G**
- C. **Attendance at Bidder's Meetings:** The AOC Project Manager will schedule the Bidder's Meeting in coordination with the AOC Procurement Division, the Construction Manager, and the Associate A/E. The Bidder's Meeting will be scheduled approximately 7 calendar days after the start of the bid period. The Associate A/E shall assist the Construction Manager in preparation for and participate in the Bidder's Meeting. The Construction Manager will prepare meeting minutes and tabulate the list of *Requests for Interpretation* (RFI), and forward the listing of RFIs to the Associate A/E for resolution. **G**
- D. **Site Visits:** Coordinate the timing of Bidder's site inspection visits with the Construction Manager, participate in such visits, record lists of questions raised by attendees, and coordinate such lists with the Construction Manager for incorporation in Addenda. **G**
- E. **Preparation of Amendments:** All [amendments](#) which are required to clarify the bidding documents, respond to RFIs, accomplish revisions, accept or reject substitutions, and correct errors shall be prepared by the Associate A/E and forwarded to the AOC Project Manager for approval and for subsequent distribution by the Construction Manager. Prepare [amendments](#) in formats similar to those used in the Project Manual, listed in the order of the Project Manual and drawings, [amendments](#) numbered sequentially and dated. Do not include Bidder's Meeting minutes in [amendments](#). Issues forwarded to the Associate A/E by bidders shall be reviewed, determinations made, and draft text forwarded to the AOC Project Manager within 7 calendar days of the bidder's addenda request for inclusion in the [Amendments](#). **G**
- F. **Receipt of Bids and Evaluation:** The Associate A/E may be present during the opening of bids, but is advised of the confidentiality rules concerning opening of bids. The Associate A/E shall assist the AOC and the Construction Manager in the evaluation of the bids. **G**
- G. **Post Bid Revisions:** The Associate A/E shall enter all approved revisions to the Project Manual and the drawing reproducible masters, annotated with approved revision symbols and underscoring, and deliver the annotated sheets to the AOC for reproduction of construction sets.

Only sheets or pages bearing revisions need to be resubmitted. The Contractor will be informed that the published addenda remain the legal basis for the project. **G**

4cm.10 **CONSTRUCTION ADMINISTRATION PHASE**

A. **General:** This section addresses jointly shared construction administration responsibilities provided for Large Projects - distributed between the Associate A/E, the AOC Project Manager and the AOC Construction Manager. These responsibilities may differ from those employed in the private sector or with other Federal agencies.

1. **Professional Services Contract:** Services in this section are dependent on options for Construction Administration being exercised in the Professional Services Contract.
2. **Requested Attendance:** As the lead member of the design team, the Associate A/E is requested to attend both the Ground Breaking ceremony and the Ribbon-Cutting ceremony.
3. **Site Access:** Authorized representatives of the Associate A/E shall have access to the Project Site at all times in which work is being performed.
4. **Limitations on authority of architect-engineer:** Unless specific exceptions are established by a written instruction issued by the contracting officer, the Associate A/E firm:
 - (a) shall not authorize any deviation from the construction contract documents or approve any substitute materials or equipment.
 - (b) shall not exceed limitations on the government's authority as set forth in construction contract documents.
 - (c) shall not undertake any of the responsibilities of the contractor, subcontractors, construction contractor's superintendent or contractor quality control representative.
 - (d) shall not expedite or accelerate the work of construction contractor and subcontractors.
 - (e) shall not advise on or issue directions relative to any aspect of the means, methods, techniques, sequences or procedures of construction unless such is specifically called for in construction contract documents. (FAR-5252.236)

B. **Project Administration:** The Associate A/E shall direct all communications with the Contractor through the Construction Manager except as specifically provided herein.

1. **Document Annotation:** Ensure that all construction documents have been annotated to reflect modifications issued during the Bid period and to reflect any Options exercised by the AOC. **G**
2. **Mobilization/Project Startup:** The Associate A/E will be notified by the Construction Manager of the Contractor's successful completion of mobilization procedures required by the Construction Contract and the Contractor's schedule to commence site operations:
 - a. **Pre-Construction Submittals:** Receive copies of Contract-required documents submitted by the Contractor and review for compliance with the Contract. Notify the Construction Manager of any deficiencies. **G**

- b. ***Pre-Construction Meeting:*** Associate A/E's field representative shall attend the Pre-Construction Meeting conducted by the Construction Manager. The Associate A/E shall note corrections to the minutes for the CM. **G**
- c. ***Partnering Session:*** Assist in the preparation for and participate in the "partnering session" conducted by the Construction Manager at commencement of the construction. **G**
- 3. ***Progress Meetings:*** The Associate A/E shall attend the regularly scheduled field meetings, review CM prepared minutes, and provide corrections to the CM.
- 4. ***Construction Conferences:*** At times necessitated by construction conditions, attend construction conferences and notify the Construction Manager of any errors in the minutes or unresolved issues.
- 5. ***Contractor's Initial Submittals:*** The Associate A/E shall review and recommend for approval the Contractor's Initial Schedule of Values, Material Schedule, Submittal Schedule, Progress Schedule, and Contractor's Testing Agencies.
- 6. ***Requests for Payment:*** The Associate A/E shall make the initial review of Contractor Requests for Payment as processed and forwarded by the Construction Manager, shall review the amounts due to the Contractor, and shall forward all such requests, with the Associate A/E's recommendation for action to the Construction Manager.
 - a. ***Record Document Updating:*** The Associate A/E shall verify Contractor updating of the record documents (as-builts) to current status prior to recommending payment approval.
- 7. ***Construction Photographs:*** All construction photographs will be provided by the AOC unless otherwise specified in the Professional Services Contract.

C. Projects Controls and Decision Expediting:

- 1. ***Clarifications and Interpretations:*** The Associate A/E shall resolve all requests for clarification or interpretation forwarded by the Construction Manager within the time periods provided.
 - a. ***Contractor Error:*** Costs for processing RFIs resulting from oversight or failure to locate properly documented information on the part of the Contractor will be charged to the Contractor.
 - b. ***Errors & Omissions:*** RFIs resulting from discrepancies, errors, or omissions shall be resolved without processing cost to the Contractor and the Government.
 - c. ***Routing:*** The Associate A/E shall forward its response through the AOC's Construction Manager within 5 calendar days of receipt. The AOC will review the Associate A/E's response and, if approved, will forward the response to the Contractor. If the Contractor's RFI is highly involved or will clearly require more than 5 days to resolve, the Associate A/E shall notify both the Contractor and the AOC's Construction Manager as soon as practicable after identification of the complexity.

2. ***Processing of Submittals:*** The Construction Manager shall ensure that the Contractor has properly reviewed, coordinated, and stamped all submittals prior to submitting them for approval. The Associate A/E shall review, and approve all submissions of product data, shop drawings, calculations, coordination drawings, samples, and mock-ups for compliance with Contract Documents, consistency between drawings and specifications, consistency between disciplines, and reasonableness of tolerances. The Associate A/E shall ensure that submittals do not deviate from requirements of the contract documents. The Associate A/E is responsible for proper coordination of the reviews of its sub-consultants.
- a. ***Processing Time:*** Process within 14 calendar days of receipt. Submittals requiring review and coordination with the Associate A/E's sub-consultants are allowed an additional processing time of up to 7 calendar days. Hold submittals requiring coordination with other submittals until all required submissions are received. Monitor submittals received against approved Contractor Submission Schedule.
 - b. ***Compliance with Contract Documents:*** Special attention to both performance and prescriptive specifications is required due to the "open" nature of government bidding. Ensure that submissions of "approved equals" comply fully with specified salient characteristics. Ensure that the Contractor has documented that submitted "approved equals" do not introduce incompatibilities with other work on the project. Further ensure that submitted "approved equals" are not requests for "contract modifications" or "change orders." Verify inclusion of necessary field measurements for all equipment requiring field fitting.
 - 1) ***Calculations:*** Ensure that required calculations prepared to demonstrate product or material compliance with specifications are accurate and that they bear the seal of a professional licensed to practice in the District of Columbia.
 - 2) ***AOC Review:*** The AOC reserves the right to review a pre-identified subset of submittals to verify conformance to AOC operational requirements and either concur with the Associate A/E's notations or to request further review prior to their return to the Contractor. Should the AOC make any annotations, the Associate A/E shall review the AOC annotations to verify their compliance with the Contract Documents. If in the opinion of the Associate A/E any AOC annotations constitute a change to the contract, the Associate A/E shall notify the AOC in order to obtain a decision as to whether or not the Government wishes to forego the annotations or to proceed with a formal Contract Modification.
 - c. ***Annotation:*** Comply with Architect's Action notations specified in AOC Division 1 sections. Mark and stamp a single set of shop drawing reproducibles. The Contractor is responsible for the production of multiple copies for their use. Retain a minimum of one copy of each annotated shop drawing for the Associate A/E and forward one "hold" copy for the AOC.
 - d. ***Routing:*** The processed submittals shall be forwarded back to the Contractor through the AOC's Construction Manager to permit AOC review of the processed submittals.

3. **Construction Field Observation:** The Associate A/E shall visit the Project and conduct on-site observations of the Work at intervals appropriate to the stage of construction but in no case less than on a weekly basis. Prepare field reports in an approved format and submit to the Construction Manager and the AOC.
 - a. **Quality Assurance:** The Associate A/E will coordinate inspection and acceptance of initial product and material installations to establish a standard (or benchmark) of quality to be used by the Construction Manager in the approval or rejection of succeeding like work. When differences of interpretation are encountered, document the facts as obtained from all parties involved, and report them to the AOC Project Manager for resolution.
 4. **Project Schedule Monitoring:** The Associate A/E shall monitor the Contractor's work progress and shall notify the Construction Manager of any delays.
- D. **Construction Modifications (Change Orders):** The Construction Manager will prepare and process for AOC approval all Change Orders. The Associate A/E shall analyze Change Order requests for conformance with design intent. Final acceptance of all Change Requests resides with the AOC. Requests for "approved equals" will not be accepted as the basis for change order requests.
- E. **Certifications and Test Reports:** The Associate A/E shall review and approve all Contractor certifications and test reports.
1. **Certifications:** Ensure that products and materials requiring certification of compliance with required standards and tests have proper certifications submitted. Retain copies for record.
 2. **Test Reports:** Associate A/E shall review and approve testing laboratory results. The Associate A/E shall approve the procedures for and observe the initial iterations of all field tests for such areas as air balancing, elevator load tests, etc. Ensure that where required manufacturer's representatives are present to approve any installations or tests required for provisions of warranties.
- F. **Project Closeout:**
1. **FFE Coordination:** Coordination of Government furnished furniture, fixtures, and equipment shall be provided in accordance with the Professional Services Contract. The AOC will furnish required listings of required items and of agency representatives appropriate to the items covered. **G**
 2. **Punch Lists:** The Associate A/E, together with the Construction Manager, shall prepare a list of items, which the Associate A/E and the Construction Manager have observed as requiring remedial work or replacement. The Associate A/E shall review and recommend appropriate action to the Construction Manager and the AOC on the list of items to be completed or corrected, and shall recommend to the AOC Final Acceptance when all requirements of the Contract Documents are complete. **G**

3. **Operational Training:** The Associate A/E shall ensure that training of Government employees has been conducted and maintenance schedules and methods are clearly presented for implementation by the Government. Maintenance schedules and methods shall be addressed specifically to the equipment as employed in the project. **G**
4. **Record Submittals:** The Associate A/E shall review, for completion of submittal requirements only, the Contractor's submission of record drawings and operating and maintenance instructions, and all manuals, brochures, and drawings furnished by the Contractor relating to the operation and maintenance of the Project. **G**

4cm.11 **CONSULTANT PROJECT CLOSEOUT**

- A. **General:** As part of final project closeout collect, organize, and transmit to the AOC any revisions to specifications, construction modifications, *Requests for Interpretation*; etc. that have not been previously delivered to the AOC.
- B. **As-Built Documentation:** If the Professional Services Contract or Task Order requires Associate A/E preparation of "as-built" CAD files incorporating all field revisions and construction modifications update the appropriate construction drawings and forward electronic copies to the AOC. If the Professional Services Contract or Task Order requires review and approval of "as-built" CAD data prepared by others, complete that review and transmit findings to the AOC.
- C. **Final Payment to Associate A/E:** Following delivery and AOC approval of Consultant Closeout documentation, prepare and submit request for final payment.

END OF PART 4cm

PART 5 - THE DRAWINGS

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PART 5 - THE DRAWINGS

5.1 INTRODUCTION

- A. **General:** This chapter describes required documents within Small, Medium, and Large Projects. Use the information in this chapter to prepare the individual documents for the given project.
- B. **Document Security:** Unless otherwise directed, in writing, all AOC drawings and electronic copies thereof shall be considered at a minimum to be *sensitive but unclassified* (SBU).

1. **Drawing Sheets:** The following shall be imprinted on *each* page of the information:

**PROPERTY OF THE UNITED STATES GOVERNMENT
FOR OFFICIAL USE ONLY
Do not remove this notice
Properly destroy documents when no longer needed**

2. **Document Cover Pages:** The following paragraph will be included on the cover page of the information (such as the cover page on a set of construction drawings and on the cover page of the specifications) and on the label of magnetic media:

**PROPERTY OF THE UNITED STATES GOVERNMENT
COPYING, DISSEMINATION, OR DISTRIBUTION OF THESE DRAWINGS, PLANS
OR SPECIFICATIONS TO UNAUTHORIZED USERS IS PROHIBITED
Do not remove this notice
Properly destroy documents when no longer needed**

3. **Text Size:** The previous two statements shall be prominently labeled in bold type in a size appropriate for the document. On a set of construction drawings, for example, the statements should be in a minimum of 14 point bold type.
- C. **Metric Dimensioning:** Drawings and specifications for modifications and renovations of spaces and areas within existing buildings shall be prepared using convention Imperial dimensioning. Prepare drawings and specifications for *new* buildings in accordance with the following standards:
1. **ASTM E 380:** Standard for Metric Practice.
 2. **ASTM E 612:** Standard Practice for the Use of Metric (SI) Units in Building Design and Construction.
 3. **“Soft Metric:”** Designs shall be conceived and documented in “soft” metric. That is, standard products shall be used for design and construction with their inch-pound measurements converted to metric equivalents. Notation and dimensioning shall be “hybrid” with both the traditional English and hard metric values indicated on drawings and in specifications. For new buildings, notation and dimensioning shall be metric with

the equivalent English units shown in parenthesis. For projects involving existing buildings and facilities constructed using English units, the Metric units shall be shown in parenthesis.

5.2 SHEET NUMBERS

- A. **Drawing Set Organization:** Organize drawing sets and utilize system formats specified in the *Uniform Drawing System* (UDS) as published by the Construction Specifications Institute. The *UDS* is used for the sheet number and computer file suffix portion of the file name. The number generated by the *UDS* below should be entered into the title block drawing number box. Complete copies of the standard may be obtained from CSI. Build a sheet name based on the following:

1. **Discipline Designation:** At the highest level denotes the major design discipline used for the file, this. Each major discipline is further sub-divided as required. For *most* work the AOC only uses this level discipline designations indicated by a single character.

G	General	F	Fire Protection
H	Hazardous Materials	P	Plumbing
C	Civil	M	Mechanical
L	Landscape	E	Electrical
S	Structural	T	Telecommunications
A	Architectural	R	Resource
I	Interiors	X	Other Disciplines
Q	Equipment	Z	Contractor/Shop Drawings/ As-Builts

- a. **Note:** Use the letter “D” for the second character for demolition drawings.

2. **Sheet Type Designation:** A single numerical character is used to designate sheet type. All sheet types may be used by discipline designators. The sequence listing is used for binding order and set assembly:

Number	Description
0	General - Symbols legend, notes, etc.
1	Plans - Horizontal
2	Elevations - Vertical views
3	Sections - Section views
4	Large Scale Views - Plans, elevations (interior), or sections that are <i>not</i> details.
5	Detail
6	Schedules and Diagrams
7	User Defined
8	User Defined
9	3D Representations - Isometrics, perspectives, photographs.

3. **Sheet Sequence Number:** The sequence number simply identifies the sheet's location in the discipline series. The following examples demonstrate what should be entered into the sheet number box in the title blocks:

G001	Cover Sheet.
A301	Architectural Sections - Sheet 1.
AD101	Architectural Demolition Plan - Sheet 1.
E103	Electrical Plans - Sheet 3 in plan series.
M602	Mechanical Schedules - Second sheet of schedules.

4. **CAD File Numbers:** The UDS number coupled with the AOC Project number and a linking underbar (_) produces the *MicroStation* File name. This number should be entered into the title block box that is identified as *CAD File Number*. For example:

990012_A301.dgn	Project Number 990012, Architectural Sections - Sheet 1.
990234_E103.dgn	Project Number 990234, Electrical Plans - Sheet 3 in plan series.
990034_M602.dgn	Project Number 990034, Mechanical Schedules - Second sheet of schedules.

5.3 TITLE PAGES, COVER SHEETS AND INSTRUCTIONS

- A. **Standard AOC Title Sheets (Drawings):** The AOC will issue standard CAD template files for use on each Project. Title sheets include the following information:
1. **Project Title:** The official title of the Project..
 2. **Project Number:** The AOC Project Number (not the Associate A/E's number).
 3. **The AOC:** The name and title of the Architect of the Capitol.
 4. **The Associate A/E:** The Associate A/E's name and those of all supporting design disciplines.
 5. **The Date:** The final Bid date as provided by the AOC.
 6. **Reference Symbolology:** As appropriate, input fields for the Index of Drawings, Vicinity Maps, Reference symbolology, etc. The AOC will make CAD symbols available for each of the preceding.
 7. **Code Data:** Code updated through (date), Use Group covered, Type of Classification.
 8. **Signature Block:** Provide a space for the Architect's signature.
 9. **Phase:** For all but the final submissions, provide notation of the design phase.
- B. **Standard Construction Drawings:** The AOC will issue standard title blocks, in CAD format, for each of the standard industry sheet sizes. Separate title blocks are available for detail sheets to accommodate Uniform Drawing System grid layouts. Title blocks differ slightly for each design discipline to allow for layer registration on final plots. For Large projects, sheet sizes of 30" x 42" and 36" x 48" will be accepted. For Small and Medium Projects, 22" x 34" sheets are preferred (for 11"x17" plotting). Obtain approval of the Architect before using other sizes.

- C. **Schedules and Tables:** The AOC will issue approved Schedule formats, designed to accommodate FAR restrictions relating to use of brand names and manufacturer's model numbers. Associate A/Es may utilize computer-driven schedule systems provided that they comply with the formats presented by the AOC. In the absence of AOC formats, comply with UDS formats.

5.4 GRAPHIC CONVENTIONS

- A. **Graphic Standards:** Comply with drafting conventions and drafting symbology specified in *Architectural Graphic Standards*, Ninth Edition, published by the American Institute of Architects and John Wiley & Sons, Inc. Use normal industry drafting conventions regarding line weights, styles, etc. Except where dimensions are noted, include graphic scales for all drawings.
- B. **UDS System Graphics:** The use of "system graphics" is encouraged. Utilize UDS specifications for system graphic drawing grid spacing.
- C. **CAD requirements:** See Part 7, Computer Aided Design Requirements.

5.5 REQUIREMENTS BY DISCIPLINE

- A. **General:** Use title blocks furnished by the AOC. [Unless otherwise noted, requirements in this article apply to all elements or components within a drawing.](#) Comply with the following for all construction drawings:
 - 1. **Minimum scales:**
 - a. Civil/Site Plans: 1" = 30."
 - b. Floor, Roof, and Foundation Plans: 1/8" = 1'- 0" or (1:100).
 - c. Wall sections: Either 1/2" or 3/4"= 1'- 0" (1:20 or 1:30).
 - d. Details: 1-1/2" or 3"= 1'- 0" (1:5 or 1:10).
 - e. Temperature Control: 1/16" = 1'- 0" or (1:200).
 - f. All sheets shall contain graphic scales for each scale used.
 - 2. **Other drawing conventions:**
 - a. Use match lines to identify portions of buildings or site shown on separate sheets
 - b. Show column lines and numbers on all floor plans. Show room names and numbers on architectural floor plans. Assign room names and numbers to all spaces including corridors and mechanical rooms.
 - c. Indicate the finished floor elevation for each floor area on all disciplines.
 - d. All details shall be specific to the project. Do not use commercial details based on and labeled with brand names.
 - e. Clearly identify work that is by others and not part of the contract.

3. **Remodeling/Renovation Projects:** Provide two drawings for each floor plan. One drawing shall show existing construction and demolition. The other drawing shall show new construction and existing construction to remain. This requirement applies for all submittals and all divisions of work. Use existing room numbers on demolition drawings.

B. Civil/Site Drawings:

1. **Index Contours:** Every fifth contour line shall be shown as an index contour.
2. **New Work:** Show all new topography, new spot elevations, new and existing structures scheduled to remain, roadways, walks, curbs, locations of drains and sewers, other identifiable features and furnishings to be provided, and areas of planting and landscaping.
3. **Sections:** Provide cross sections for all new roadways and sewers. Indicate invert elevations of all sewers, catch basins, and manholes.
4. **Drainage:** Indicate drainage patterns and positive flow to sewers and catch basins.
5. **Utilities:** Indicate site utilities including gas, sanitary sewer, domestic water, and fire protection water. Indicate overhead and buried electrical, communication, and fire alarm services.
6. **Soil Boring Logs:** Soil boring logs indicating soil conditions shall be included on drawings, with references to the title, date and author of the soils report. Indicate soil boring locations on appropriate plans to show relationships to existing and finish grades. Draw logs to appropriate engineering scales to indicate depth of boring log below ground.

C. Architectural Drawings:

1. **Floor Plans:** Provide a plan of each floor and roof, including walls, doors, partitions, columns, equipment, etc. Indicate walls and partitions, doors, windows, built-in equipment, breaks in slabs, material indications, complete dimensioning, stairs and vertical penetrations, reference symbols, overhead obstructions, and other standard industry conventions. Indicate high and low points on roof plans and show exact slopes.
 - a. **Room Perimeters:** It is mandatory that all rooms and spaces have their perimeters traced with closed shapes to the face of walls in conformance with Part 7, Computer-Aided Design Requirements. (Trace perimeters on Level 5, turn level off for final CD plotting).
2. **Elevations:** Provide elevations of each facade, clearly indicating materials, penetrations, and other fenestration.
3. **Sections:** Provide longitudinal and transverse sections through the entire building.
4. **Schedules:** Provide schedules of finishes, doors, windows, and accessories. Utilize generic naming conventions and AOC formats within schedules.
5. **Details:** Provide large scale wall sections and details of connections and interfaces as required to clearly delineate construction requirements.
6. **Special Areas:** Provide enlarged scale plans of all specialty areas, including but not limited to kitchens, toilet and restrooms, laboratories, etc.
7. **Work By Others:** Identify equipment to be provided by others but installed under this contract.

D. Structural Drawings:

1. **Plans:** Provide dedicated structural plans for each floor, roof, and foundation level of the building, drawn at the same scale as the architectural floor plans, mounted coincidentally to the same global coordinate.
 - a. Indicate overall dimensions, center lines of columns, locations and labels of members, openings, sleeves, and offsets.
 - b. Locate columns on grid lines.
 - c. Indicate elevations for the tops of beams and slabs.
 - d. Indicate elevations for the tops and bottoms of columns, and for the bottom of footings.
2. **Notes:** Provide the following within the General Notes on the plans:
 - a. Design live, winds, and seismic loads.
 - b. Detailed breakdown of dead loads.
 - c. Net allowable soil bearing capacity.
3. **Expansion Joints:** Indicate locations of expansion/control joints on plans and elevations.
4. **Connections:** Provide complete connection details for structural steel framing connections, and complete bar diagrams and schedules for reinforced concrete components.
5. **Schedules:** Provide schedules for footings, columns, beams, girders, slabs and lintels, etc., using generic naming conventions and AOC formats within schedules.

E. Mechanical Drawings: Mechanical drawings include HVAC, Plumbing and Temperature Control drawings.

1. **Plans:** Provide ductwork plans for each floor, indicating ductwork over 12" to scale with double lines. (Do not shade or fill areas between edges of ductwork).
 - a. Indicate devices such as balancing dampers, turning vanes, extractors, splitters, access doors, etc. on the appropriate plans and details.
 - b. Indicate duct linings and insulation.
 - c. Indicate maintenance clearance areas for tube pulls, filter replacement, coil pulls, etc. for equipment that requires such maintenance. Coordinate room door size dimensions with architectural drawings to permit transit of required maintenance items into installation areas. Show connections to equipment.
 - d. Indicate the location, size, and type of fire dampers and access doors.
2. **Details:** Provide details for major heating and plumbing equipment such as pumps, coils, boilers, chillers, water heaters, and air handling units, showing associated valves, gauges, thermostats, unions, drains, etc.
3. **Piping Plans:** Provide piping plans for each floor, indicating piping over 12" to scale with double lines.

- a. Provide waste and vent, hot and cold water riser diagrams and isometrics for fixture groups containing four or more fixtures. Number fixture groups. Show air chambers on isometrics. Schedule plumbing fixtures generically. Indicate valves, cocks, unions, strainers, gauges, drains, etc. on plans or in typical details.
 - b. Indicate underground plumbing on foundation drawings.
4. **Schedules:** Provide schedules for equipment, including, but not limited to, air handling units, fans, coils, diffusers, registers, grilles, pumps, chillers, cooling towers, boilers, unit heaters, convectors, etc., using generic naming conventions and AOC formats within schedules.
5. **Roof Plans:** Provide roof plans showing all roof mounted equipment where such equipment is used.

F. Electrical Drawings:

1. **Single-Line Diagrams:** Provide a single line diagram of power distribution, including emergency power distribution and ground fault protection. Show riser diagrams.
2. **Distribution Drawings:** Provide electrical distribution drawings at the same scale as the architectural floor plans, mounted coincidentally to the same global coordinate.
 - a. Define switching methods employed.
 - b. Define equipment, metering, and service entry to be provided by the utility company, and delineate AOC interfaces to same.
3. **Lighting Drawings:** Provide electrical lighting drawings at the same scale as the architectural floor plans, mounted coincidentally to the same global coordinate.
 - a. Indicate lighting fixtures drawn to scale.
 - b. Indicate lighting panels drawn to scale in plan drawings.
4. **Schedules:** Provide schedules for all equipment, including, but not limited to, panelboards, switchboards, motor control centers, etc., using generic naming conventions and AOC formats within schedules. Provide a minimum of 10% spare poles.
5. **Grounding:** Clearly define equipment grounding system, indicating any special requirements for interference shielding, isolation systems, and filters, as required.
6. **Lightning Protection:** Provide lightning protection plans and details sufficient to obtain testing laboratory Master Label.
7. **Work By Others:** Identify equipment to be provided by others but installed under this contract.
8. **Other Data:** Completely circuit Telephone systems, Sound and PA systems, CATV systems and Legislative clock systems on the plans or on riser diagrams:

G. Fire Safety:

1. Provide sprinkler plans with piping indicated and sized. Show locations of heads.
2. Show fire extinguisher cabinets on architectural drawings.
3. Provide large scale plans and details of specialty areas such as restrooms, kitchen areas, computer spaces, etc.
4. Indicate fire alarm and detection systems.

5.6 DELIVERABLES

A. **Materials:** Schematic sketches and drawings may be prepared on either vellum or polyester, with presentation to the Architect on either blue-line or xerographic paper. Design development drawings shall be prepared on polyester, with similar means of presentation to the Architect. Construction documents shall be prepared (plotted) on polyester material (4-mil minimum thickness) and final construction (100% backcheck) base-lined electronic representations (i.e., CAD files) forwarded on approved media. It is not necessary to transmit 50% or 100% construction document review sets on electronic media.

1. **Plots:** Half size plots - drop line weights or plot with reduced thickness weights by changing the plotter driver or using a pen table. Do not plot half-size plots with standard pen weights. Plans with unintelligible text will be returned for correction.

END OF PART 5

PART 6 - THE PROJECT MANUAL

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- 6.1 INTRODUCTION**
 - 6.2 PREPARATION OF SOLICITATION DOCUMENTS**
 - 6.3 FEDERAL LIMITATIONS**
 - 6.4 GENERAL FORMAT**
 - 6.5 SPECIFICATION LANGUAGE**
 - 6.6 DELIVERABLES**

PART 6 - CONSTRUCTION DOCUMENTS - THE PROJECT MANUAL

6.1 INTRODUCTION

- A. **General:** Project Manuals prepared for the Office of the Architect of the Capitol are required to be formulated in accordance with recommendations and formats established by the Construction Specifications Institute (CSI) and delineated in CSI's "*Masterformat*®," Current Edition. The *A/E Design Manual* is prefaced on compliance with the above requirement and as a result of review comments provided by the AOC to consultants over the past 10 years.
- B. **AOC Use of *MasterSpec*®:** The AOC uses the American Institute of Architects's (AIA) *MasterSpec*® system for internally prepared specifications. Unedited *MasterSpec*® sections are not available from the AOC, in either printed or computer media due to licensing agreements. Edit project specifications to conform to *AOC Design Standards*.
- C. **Buy America Act:** The AOC is bound to strict compliance with the Buy America Act (41 U.S.C. 10a).
- D. **Proprietary Items:** Develop listings of required proprietary items early in the design process and submit listings for AOC approval. Do not base critical design solutions on the use of proprietary items without previous AOC approval. Listings of items for which the AOC requires matching to existing construction will be provided to the Associate A/E by the Project Manager. "Sole source" products shall require submission and approval of AOC "*Justification for Sole Source Products*" (See Appendix 6b) and available in electronic format as *Sole Source - Products.wpd*.

6.2 PREPARATION OF SOLICITATION DOCUMENTS

- A. **The Project Manual:** The AOC differs from commercial practice in that it divides the Project Manual into two volumes, Business and Technical, to conform the solicitation more closely to Federal Acquisition Regulation (FAR). While the document configuration differs somewhat from commercial practice, basic solicitation and contract data is still included. The AOC will make available a "SpecChecklist" to assist with preparation of Volume 1 and Division 1.
- B. **Volume I - Business:** The Business Volume of the Project Manual will be prepared by the AOC Procurement Division. Samples will be forwarded by the Project Manager. Certain sections will require lists or other input from the Project Manager or Associate A/E as detailed below.
 - 1. **Table of Contents:** Prepared by the AOC from a listing of sections forwarded by the Project Manager or Associate A/E in computer formats.
 - 2. **Solicitation, Offer, & Award Form:** The invitation to bid, contractor's bid or offer, and the notice of award are included in this form.

3. ***The Schedule:*** The contractor's bid or offer is scheduled on this form. The Associate A/E shall prepare a draft description of the Base Bid and all approved Options.
 4. ***General Conditions:*** This document provides the basic legal conditions of the contract.
 5. ***Supplementary Conditions:*** This document requires input from the Project Manager or the Associate A/E. Contract time, special security provisions, and other modifications of the General Conditions are included here. The Associate A/E shall provide an estimate of Contract Time to the Project Manager.
 6. ***Representations & Certifications:*** This document includes Federal certifications of independent price determination and requirements for taxpayer identifications.
- C. **Volume 2 - Technical:** The Technical Volume of the Project Manual shall be jointly prepared by the Project Manager (or the Associate A/E) and the Technical Support Division as specified below:
1. ***List of Drawings:*** The Project Manager or the Associate A/E shall submit a listing of contract drawings, with sheet numbers and titles for each drawing, in computer format to the AOC for inclusion in the final solicitation package.
 2. ***Division One - General Requirements:*** The AOC Technical Support Division will forward the AOC Guide Specification(s) for Division 1, GENERAL REQUIREMENTS, to the Associate A/E. The Associate A/E shall edit Division One, with the input of the Project Manager, and the Superintendent's Project Coordinator.
 3. ***Divisions Two - Sixteen - Technical Sections:*** See below for requirements for preparation of these sections.
 4. ***Submittals List:*** The Associate A/E shall prepare a listing of all submittals required under the contract and submit in either *Microsoft Excel* or *Word Perfect* "table" formats. Provide column headings for section number, section title, description of required submittal, and an indication of who must review the submittal (i.e., A/E, AOC Project Manager, AOC Task Leader, or Other).
 5. ***Requests for Proposals:*** The Associate A/E shall develop a draft listing of Contractor selection criteria and forward it to the Project Manager.

6.3 FEDERAL LIMITATIONS

- A. **General:** The following text is drawn (and adapted somewhat) from the General Services Administration Guide Specifications system, *MASTERSPEC GSA Edition*:
1. ***FAR:*** Part 10 of the Federal Acquisition Regulations (FAR) address specifications and make it mandatory that they be non-proprietary and open. The basic reason for this is fairness; to ensure open competition and to prevent abuse, both within Government and by those under contract to the Government. While Architect/Engineers under contract to AOC have a great deal of latitude in the types of products they can specify, they do not have as much latitude in the methods they can use in specifying them as they would in the private sector. For this reason, the private sector master text often must be modified. Although some consultant A/E's would prefer to use their own proprietary specification methods to reduce their own workload, the costs to the AOC in litigation, protests,

construction delays, and external pressure from manufacturers far outweigh any perceived savings in design time.

2. **Prohibitions:** Do not contact vendors for pricing or preparation of cost estimates, or to generate specification sections. Such contact compromises the open bidding restrictions and may preclude that vendor from bidding on the resulting project.
- B. **Use of Brand Names:** Brand name specifications should be avoided in project specifications. However, the FAR recognizes that there will be instances where "brand name or equal" is *the only feasible way of specifying a product*. However, in order for the Contracting Officer to interpret product quality during construction phase product approval cycles, the regulations require that specifications set forth the *salient physical and functional characteristics* essential to Government needs. The "Brand Name or Equal" provision contained in the AOC guide Supplementary Conditions document will clarify the use of brand names. "Any A/E who thinks that specifying a product by trade name without the "or approved equal" will ensure that the Contractor will furnish that product is probably mistaken." Examples include the following:
1. **Historic Materials:** An acceptable use of brand names occurs in historic preservation work, where it may be necessary to specify a difficult to find material. In such case, it is permissible to specify a known source by stating the suppliers name, address, and trade name of the product while stating the product's required salient characteristics.
 2. **No consensus standards:** Multiple brand names may also be used for areas in which industry or federal standards are not available or are not readily accessible to bidders. In particular, painting sections may include a listing of *specific brand and series/line* descriptions similar to the following to establish a paint grades:
 - "1. Gypsum Drywall Primer: White interior latex-based primer.
 - a. Devoe: 50801 Wonder-Tones Latex Primer and Sealer.
 - b. Fuller: Pro-Tech Interior Latex Wall Primer and Sealer.
 - c. Glidden: 5019 PVA Primer.
 - d. Moore: Moore's Latex Quick-Dry Prime Seal #201.
 - e. PPG: 6-2 Quick-Dry Latex Primer Sealer.
 - f. P & L: Latex Wall Primer Z30001.
 - g. S-W: Pro-Mar 200 Latex Wall Primer B28W200.
 - h. Approved equals."
- The listing is extensive enough to establish suitable grades and allows most vendors to provide their equivalent lines for approval. To list the particular formulas of each brand would be both verbose and, if ranges were included to allow all vendors, could change the end results of the paint formulas. Note, however, that in each case a particular series or line is included. *Simple listings of approved manufacturers, as is allowed in industry specifications, will not be accepted.*
3. **Other Uses:** Use of brand names is also accepted for specific natural stone designations, i.e., stone name and quarry, and for areas where end function within a class may be hard to describe, such as toilet accessory functions. A provision that stated "The catalog numbers of XXXXX Co. are included to establish functional characteristics of the

specified toilet accessories. Products of other manufacturers will be accepted provided they conform to the material properties of this section and comply with the functional characteristics of the listed models."

4. **MasterSpec Listings:** The listing of "Approved Manufacturers" contained in the standard *MasterSpec* system is *not acceptable*. Any other uses of brand names in AOC specifications should be referred to the Technical Support Division prior to inclusion in any project specifications. Please note:

The AOC reserves the right to delete non-conforming provisions from any specification prior to bidding!

- C. **Qualification Statements:** Exercise caution in the specification of minimum contractor or installer qualification provisions. Phrases such as "5 years minimum experience installing ..." are **not** acceptable for AOC specifications. Qualification provisions based on length of time experience cannot be defended in court and are not permitted under FAR. If a section requires more than ordinary skill in installation or construction, then use of the "Specialist Clause" (included below) should be considered. For example:

"Installer Qualifications: A contractor who qualifies as a "Specialist" under the provisions of Division 1, GENERAL REQUIREMENTS."

It is acceptable to require that Work in any specific system for which a warranty is required, be performed by an "authorized" or "certified" installer or contractor with whom the manufacturer has agreed to provide warranty coverage. It is also acceptable to require that all work of a section be performed by a single entity if project conformity would be adversely affected otherwise:

"Fabricator Qualifications: All work of this section shall be fabricated by a single firm."

Application of these provisions requires a degree of professional judgement. If desired, the AOC Project Manager will be pleased to clarify any particular provisions on a case-by-case basis. For highly specialized work, the AOC will work with the specifier to include special qualification language in the Division "0" bidding requirements to limit contractors to the necessary specialists.

- D. **Testing Laboratories:** The Government cannot require that products be listed or labeled by particular testing organizations, such as Underwriter's Laboratories. However, the specifier may require that a product be tested in conformance with a published UL test and require that a product be tested and labeled by a nationally recognized independent testing and labeling organization.
- E. **Contract Time:** Contract Time under AOC construction contracts runs from "Award of Contract" until "Final Acceptance." The AOC recognizes the industry concept of "substantial completion" prior to Final Acceptance, and defines it as follows:

“Substantial Completion is defined as that state when the Contractor has complied with the Contract requirements, except for minor deviations and the project is sufficiently complete, in compliance with applicable life safety codes, and capable of being occupied and used by the Government for the intended purpose.”

6.4 GENERAL FORMAT

- A. **General:** All specifications contained within the Project Manual shall be drafted in conformance with *CSI's Manual of Practice*.
1. **Section Numbers:** Use of MasterFormat 5-digit numbers is required.
 2. **Section format** of all AOC specifications conforms to the CSI 3-part section format developed by CSI. Within individual sections each part is identified by a title ("General", "Product", and "Execution"). AOC specification sections are totally ordinated and paragraphs numbered (alpha/numeric format).
 3. **Heading line:** Provide a header line on each page, identifying section number and title.
 4. **Project Number:** Provide the AOC Project Number and the section/page number on each page in a footer line.
 5. **Formatting** of Part titles, Article titles, Paragraphs, and Subparagraphs, should follow standard industry practice (3.2, A, 1, etc.). On a separate line following the last line of text, provide the words "END OF SECTION," followed by the section number.
 6. **The standard text font** for the agency-produced specifications is 11 Point Windows New Times Roman or Times Roman. **Consultant typeface and pitch are optional**, but, an effort should be made to utilize a space-conserving yet readable font.
 7. **Standard AOC Cover Sheets:** The AOC will provide the Cover Sheet for the Project Manual.

6.5 SPECIFICATION LANGUAGE

- A. **Special Definitions:** The following definitions are taken directly from "DEFINITIONS AND STANDARDS", Section 01421:
1. **Indicated:** The term "indicated" is a cross-reference to graphic representations, notes, or schedules on drawings, to other paragraphs or schedules in the specifications, and to similar means of recording requirements in contract documents. Where terms such as "shown", "noted", "scheduled", and "specified" are used in lieu of "indicated", it is for the purpose of helping the reader locate cross-reference, and no limitations of location is intended except as specifically noted.
 2. **Directed, Requested, etc.:** Where not otherwise explained, terms such as "directed", "requested", "authorized", "selected", "approved", "required", "accepted", and "permitted" mean "directed by the Architect", "requested by the Architect", and similar phrases. However, no such implied meaning will be interpreted to extend the Architect's responsibility into the Contractor's area of construction supervision.
 3. **Furnish:** Except as otherwise defined in greater detail, the term "furnish" is used to mean supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.

4. **Install:** Except as otherwise defined in greater detail, the term "install" is used to describe operations at project site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
 5. **Provide:** Except as otherwise defined in greater detail, the term "provide" means furnish and install, complete and ready for intended use, as applicable in each instance.
 6. **Specialist:** The term "specialist" is defined as an individual or firm of established reputation (or, if newly organized, whose personnel have previously established a reputation in the same field), which is regularly engaged in, and which maintains a regular force of workmen skilled in either (as applicable) manufacturing or fabricating items required by the contract, installing items required by the contract, or otherwise performing work required by the contract. Where the contract specification requires installation by a specialist, that term shall also be deemed to mean either the manufacturer of the item, an individual or firm licensed by the manufacturer, or an individual or firm who will perform the work under the manufacturer's direct supervision.
 7. **Owner:** In AOC specifications use the word "Government" whenever the concept of "owner" is required.
 8. **Architect:** The design professional should be referred to as the "Architect" (meaning the Architect of the Capitol), as opposed to other terms.
- B. **Spelling and punctuation** conform as closely as possible to current standards of usage, but, if conflicts occur between spelling of words in the dictionary versus industry practices, the latter takes precedence.
1. **Minimums and maximums** are defined in text only where the possibility of confusion exists. Otherwise criteria for minimum qualities and quantities are established in Division-1 sections.
 2. **Numerals** are used rather than words for numbers, as are commonly accepted symbols contained on typewriter keyboards for such things as feet ('), inches ("), percent (%), degrees (°) or (deg.), plus (+), and minus (-).
 3. **Measurement units** for the most work in existing facilities conform to U.S. Customary System, but Metric units shall be included where currently appropriate, particularly for temperature requirements. For new, free-standing facilities utilize Metric units.
 4. **Abbreviations** included in the text of specification sections are an important language element and deserve to be fully understood by users.
 5. **Standards and trade association** names are abbreviated in a manner already established in the industry; see Division-1 section, "Definitions and Standards."

6.6 DELIVERABLES

- A. **Printed Copy:** Provide final draft in camera-ready copy printed on "laser" quality paper. Do not bind the master. Do not use standard typing bond for production of the camera-ready master. The AOC will produce the copies required for distribution to bidders. The Consultant will be provided with 3 copies of the Project Manual and 2 copies for each consultant to the prime.

- B. **Software Format:** The AOC *prefers* final documents in *Word Perfect* 6.1 or later format. Do not provide translations to *Word Perfect* from *MS WORD* documents. If original editing was not performed in *Word Perfect*, submit final deliverables in ASCII DOS text format. The AOC will not make any minor text “cleanups” on documents formatted in other than *Word Perfect*. Documents may be produced in any system the consultant chooses provided the final deliverable is translated into the above format.
- **Drawing List:** Provide full list of drawings, in electronic format.
 - **Media:** Transmit final files on 3-1/2" floppy disks, I-Omega “ZIP” disks, or CD-ROM.
 - **Electronic File Naming:** Please name specification file names by appending the section number to the AOC project number. For example, for AOC project number 970024, Unit Masonry, the file name would be: 970024_04200.wpd or 970024_04200.spec.

END OF PART 6

PART 7 - COMPUTER-AIDED DESIGN REQUIREMENTS

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- 7.1 INTRODUCTION**
 - 7.2 AOC PROVIDED INFORMATION**
 - 7.3 DRAWING NAMING - CONSTRUCTION PROJECTS**
 - 7.4 DRAFTING CONVENTIONS**
 - 7.5 DELIVERABLES**

PART 7 - COMPUTER-AIDED DESIGN REQUIREMENTS

7.1 INTRODUCTION

- A. **Use of MicroStation®:** The Architect of the Capitol utilizes *MicroStation®* software, Version 8, by Bentley Systems, Inc. This section specifies standards to be utilized for computer aided design (CAD) deliverables submitted to the AOC for standard graphic files that do not include database linkages or use of Bentley System's *Tri-Forma®* Application Environments. CAD input is required for architectural, mechanical, and electrical plans, elevations, sections, details, and schedule sheets.
1. **Large Projects:** Unless otherwise defined in the Consultant's contract, design work and deliverables shall be accomplished using *MicroStation*-based software. *On select projects, identified by the AOC, the use of TriForma Architectural, Mechanical, and Structural applications will be required.*
 2. **IDQ Contracts (Small & Medium Projects):** Indefinite Quantity consulting contracts that extend over long time periods shall have work performed using *MicroStation* software and AOC drafting standards and symbology.
 3. **Limited Scope Projects:** If specifically authorized in the Consultant's contract, projects of limited scope or of single discipline that do not involve coordination between design disciplines may be inputted using either *MicroStation* or *AutoCad*. Translation and scale conversion from other systems are the responsibility of the Consultant.
- B. **Contact the Technical Support Division:** At commencement of the project, contact the Technical Support Division to obtain copies of AOC workspaces, menus, cell libraries, etc.

7.2 AOC PROVIDED INFORMATION

- A. **Existing Plans:** The AOC will make available to the Project Manager and Associate A/E CAD drawings of all areas and disciplines as they are available within the agency's master electronic database. Consult with the Project Manager for availability of documents prior to commencing design. While master plans are believed to be current, the designer is responsible for verifying all existing conditions prior to utilizing such masters and the AOC will not be held responsible for omissions or dimensional errors contained therein. All CAD data will be transmitted in *MicroStation* .DGN formats only.
- B. **CAD Data:** The AOC will provide the consultant with the following electronic data in *MicroStation* .DGN format.
1. **Title Blocks:** Cells and user commands to *properly* place title blocks will be provided for each discipline for 22x34, 24x36, 30x42, and 36x48 sheet sizes. (For projects in which use of other formats is permitted, title block files will be provided with pre-placed title-

blocks). [Separate title sheet cells will be provided to support required signature procedures.](#)

2. **Work Spaces:** The AOC will provide a copy of the standard font library, sidebar menus and cell palettes to ease input in conformance with AOC required level/layer schemas, standard architectural/engineering symbology based on *Architectural Graphics Standards*, and a copy of AOCDEFLT.TBL, the agency's default color table.
- C. **Workspaces:** Use of third-party commercial CAD discipline-specific software is at the consultant's discretion provided the enclosed layering standards are met [and no application-specific elements remain in the file that require use of the application to operate or that could impair standard *MicroStation* usage](#), and final translations provide for verified file integrity. The AOC will make available agency workspaces to supplement standard *MicroStation* usage for the following:
1. **Architecture:** Architectural files may use native *MicroStation* with AOC Architectural Workspaces or Bentley Systems' *TriForma* file formats.
 2. **Mechanical:** Mechanical engineering files shall utilize Bentley Systems' *TriForma for Mechanical* Systems with AOC level and symbology defaults.
 3. **Electrical:** Electrical engineering files shall utilize AOC Electrical Workspaces with AOC level and symbology defaults.
 4. **Structural:** Structural engineering files shall use Bentley Systems' *TriForma Structural* with AOC level and symbology defaults.
 5. **Plumbing:** Plumbing engineering files shall use AOC Plumbing Workspaces with AOC level and symbology defaults.
 6. **Telecommunications:** Telecommunication files shall use AOC Telecommunication Workspaces with AOC level and symbology defaults.
 7. **Fire Protection:** Fire Protection files shall use AOC Fire Protection Workspaces with AOC level and symbology defaults.

7.3 DRAWING NAMING - CONSTRUCTION PROJECTS

- A. **File Naming:** See Part 6, Construction Documents - The Drawings, for drawing numbering formats.

7.4 DRAFTING CONVENTIONS

- A. **Layer/Level Names:** The use of AOC layering conventions is required for architectural, mechanical, and electrical plans. Unless specified otherwise in the consultant's contract, these levels shall be mandatory. Consult the Technical Support Division for clarification or expansion of listing, if required. Level naming standards are contained in Appendix 7a.
1. **Note:** AOC layer/level names have been derived from the [National CAD Standard](#), Architectural interfaces from Intergraph Corporation, and CAD Level Standards from the CADD/GIS Technology Center, in Vicksburg, Mississippi. [Please contact the Technical Support Division to report any conflicts that may arise between the varying standards.](#)

- B. **Line Work:** Colors, line weights, and styles shall follow standard architectural practice, and AIA "*Architectural Graphics Standards*," Tenth Edition and Appendix 7a. Please restrict actual scaled information line weights to a maximum of 3 or 4 weights. Use of standard line types is required; do not utilize "custom line styles" without prior approval.
- C. **Symbols:** Symbol names (blocks or cells) shall be limited to 6 digits or less, standard alpha-numeric characters (RAD50), in order to permit bi-directional translations to *MicroStation J systems until V8 transitions are completed*. Cell status should be maintained in delivered files. Do not drop status (or "explode") prior to delivery.
- D. **Text:** Use standard Font 1 (Working) for labels and notes. Titles and large scale text may use AOC Font 5 (Zapf Humanist) or *Arial TruType* fonts. Minimum text height when plotted for full-size plots shall be 1/10" or 1/8". These sizes support AOC microfilming and half-size plotting efforts.
- E. **Annotation:** Drawing annotation shall track either AIA *MasterSpec* "Drawing Coordination Notes" or the recommendations of the CSI. Use of system graphics and standard detail libraries is encouraged (as consistent with consultant's office practice). Use of *CSI Uniform Drawing System (UDS)* graphic techniques is encouraged.
- F. **Reference Files:** Use of reference files is acceptable; however, it is preferred that path statements are mapped to logical names or directory common to the master file. Consult Technical Support Division prior to finalizing reference file paths on deliverable files.
- G. **Working Units:** 1:12:8000 (MU:SU:PU) for English or English/Metric. When directed for new projects created in "Soft Metric" use Metric settings of 1:1000:80 and English of 1:12:2032.
- H. **Room Boundaries (Shapes):** All rooms and spaces shall have a "closed shape" tracing their areas or boundaries inputted to the face of finish construction on the CAD level/layer specified.
- I. **Dimensioning:** English/Metric for all major dimensions. For work in existing historic buildings, English only dimensioning may be used. For "Soft Metric" use Metric/English.
- J. **AutoCad® Use:** For projects authorized to use *AutoCad* software, it is mandatory that the AutoCad "Recover" or "Audit" routine be run and drawings are converted to .DGN format prior to any transmittal to the AOC. Additionally, to support bi-directional translation needs, the following limitations shall be observed during production of the *AutoCad* files:
 - 1. **Block Names:** Limit block names to 6 (six) standard alpha-numeric characters maximum, no special symbols or typographical characters (i.e., characters supported by RAD50 compression). Do not explode blocks in final drawings.
 - 2. **Fonts:** Limit text to *AutoCad*'s "Romans" or "Architxt" font. Proportioned fonts other than "*Tru-Type*" fonts are discouraged.
 - 3. **Xrefs:** Do not bind Xrefs to master drawings.

7.5 DELIVERABLES

- A. **Operating Systems:** The AOC utilizes *MicroSoft Windows NT & XP*. *MicroStation* files may be transmitted from any supported operating system provided normal PC disk drives can read the disks. Application software that loads over *MicroStation* and that runs in operating systems other than *Windows NT* or *XP* should be avoided.
- B. **Transmission Media:** Arrangements should be made with the Technical Support Division early in the project to verify suitability of computer transmission media. Do not use multiple disks to transmit single files. The AOC can accept CAD deliverables in the following media:
 - 1. 3-1/2" 1.44 MB floppy disks, CD-ROM disks, or 100 MB "ZIP" disks.
 - 2. Use electronic file naming conventions specified in Part 5.

DO NOT TRANSMIT DRAWINGS OVER THE INTERNET OR MODEMS WITHOUT PERMISSION!

- C. **Final Deliverables:** CAD files transmitted at project completion shall be free of reference file or XREF attachments that map to other directories. Extraneous construction elements shall be deleted, the file compressed and the view "fitted" (zoom extents). *MicroStation* files shall verify free of errors under the current version of EDG. Verify that file names utilize complete AOC project number prefixes. Delete construction or "non-plot" data within the title block confines from layer *A-ANNO-NPLT* (level 61) and merge all reference file data to that level.
 - 1. **Contract Document Plot Files:** Provide one electronic file of each contract drawing sheet, in Adobe *Acrobat* (.PDF) format, at full size sheet defaults. Produce the file to support full size plotting at plotter resolutions of at least 600 DPI.
 - 2. **Baselines:** Execution of the *Baseline* application on each file is encouraged for the Consultant's protection.
- D. **Hard Copy:** Requirements for traditional reproducible and printed copies of design and construction documents are enumerated in the Consultant's contract.

END OF PART 7

PART 8 - PROJECT ESTIMATING REQUIREMENTS

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- 8.1 INTRODUCTION**
 - 8.2 ESTIMATING STANDARDS**
 - 8.3 ESTIMATING SOFTWARE**
 - 8.4 COST ESTIMATE DEVELOPMENT**
 - 8.5 COST MARKUPS**
 - 8.6 REPORTING FORMATS**
 - 8.7 DELIVERABLES**

PART 8 - PROJECT ESTIMATING REQUIREMENTS

8.1 INTRODUCTION

- A. **General:** Develop a cost estimate model for the project as specified. The estimate shall be clearly and definitively linked with the project scope, for the purpose of project evaluation and funding authorization(s). Total project costs shall be included in all project cost estimates, reflecting the overall delivered cost of the finished project.
 - 1. It is highly recommended that a draft electronic copy of all estimates be forwarded for a cursory review by the Technical Support Division prior to formal submissions.
- B. **Independent Takeoffs:** All estimates submitted for the project must be prepared independent of the design team by an estimating firm outside of and not under the jurisdiction of that design team. The Architect (AOC) shall maintain oversight of the development of the A/E's construction estimates and cost control requirements.
 - 1. **Vendor Contacts:** Do not contact prospective suppliers or vendors to obtain price quotations. Pre-bid contact can compromise fair bid integrity.
- C. **Taxes:** Apply taxes to Material (ONLY) for appropriate location of work. (i.e., D.C. = 5.75%, Maryland = 5%, and Virginia = 4.5%). This tax applies only to General Contractors. Work performed by AOC Construction Branch is not taxed.
- D. **“Buy American Act:”** Adhere to the full extent of Buy America provisions when preparing cost estimates for the AOC. The Buy American Act (41 U.S.C. 10) provides that the Government give preference to domestic construction material. "Components," as used in this paragraph, means those articles, materials, and supplies incorporated directly into construction materials. "Construction materials," as used in this paragraph, means articles, materials, and supplies brought to the construction site for incorporation into the building or work. "Domestic construction material," as used in this paragraph, means (1) an unmanufactured construction material mined or produced in the United States, or (2) a construction material manufactured in the United States, if the cost of its components mined, produced, or manufactured in the United States exceeds 50 percent of the cost of all its components. Components of foreign origin of the same class or kind as the construction materials determined to be unavailable pursuant to subparagraph 25.202(a)(3) of the Federal Acquisition Regulation (FAR) shall be treated as domestic.
- E. **Fees:** Include cost of all required utility connection or hook-up fees.
- F. **Labor Rates:** Contact the Technical Support Division for current Davis-Bacon wage rates.

8.2 ESTIMATING STANDARDS

- A. **Uniformat II:** All construction cost estimates shall be prepared using the estimate systems categories and levels of detail specified within Uniformat II (ASTM E-1557-96).
- B. **ASTM E-1804-96:** Unless amended by the AOC A/E Design Manual, adhere to the Design Phase definitions and required Uniformat II design phase/level requirements specified within *Standard Practice for Performing and Reporting Cost Analysis During the Design Phase of a Project*, ASTM E-1804-96.

8.3 ESTIMATING SOFTWARE

- A. **Computer Assisted Estimating:** The AOC requires use of computer assisted estimating software for all construction cost estimates prepared for the agency. Because the agency often constructs projects using agency construction personnel, the requirement for utilizing agency approved software and work team definitions is vital to the continued use of the design estimates throughout the construction period. Additionally, the design/construction life cycle use of cost data facilitates feedback loops and cost control verification.
- B. **Medium and Large Projects:** All construction cost estimates for Medium and Large projects will be executed using U.S. Cost's "*Success Cost Management*" estimating software. The estimator shall preserve all settings and linkages supporting Uniformat II to CSI MasterFormat pricing codings so that either report can be run later. Resource loading shall be performed to facilitate scheduling. The Technical Support Division will provide Uniformat II work breakdown structure templates and AOC report formats for private sector Contractor and AOC Construction Branch methods, that can be labor and crew resource loaded.
- C. **Small Projects:** Obtain the approval of the Estimating Group within the Technical Support Division prior to using software other than "*Success*." For construction cost estimates for Small Projects, especially those that involve limited time and material quantities, estimates may be executed using standard MicroSoft "*Excel*" spreadsheets. (See Appendix 8a)

8.4 COST ESTIMATE DEVELOPMENT

- A. **Options:** The Associate A/E will ensure the choice of design options (alternatives) and selections of construction materials and equipment are evaluated from the stand point of life cycle cost effectiveness in conformance with the National Energy Conservation Policy Act. Include a design contingency at each phase commensurate with the refinement of the project design.
- B. **HazMat:** Every cost estimate for every required phase shall include separate line items for hazardous materials mitigation.
- C. **Schematics:** Augment Uniformat II Level 2 estimates with additional detail under electrical, for separate costs for service and distribution, lighting and power, special electrical; and under mechanical for HVAC, plumbing, and fire suppression. For items of work for which resource

- loading is not applicable, provide a methodology to create unit assemblies of cost. These assemblies shall define assumptions made and shall reflect the assumed units of measure and include materials, labor, and equipment in unit breakouts. Records project cost assemblies shall accompany the report and shall be entered into the *Success* system defined in the appropriate project work breakdown structure. (See Appendix 8b)
- D. **Design Development:** Prepare the Design Development estimate using Uniformat II, Level 3 based on design development floor plans, outline specifications for principle materials, finishes, and building systems, and typical unit costs for structural, mechanical, and electrical systems. Provide allowances for materials or systems not yet defined. (See Appendix 8c)
- E. **Construction Documents:** Design phase estimates shall be submitted at 50%, 100% and any required back-check (Post CD) submittals concurrent with project design development. Levels of completion for construction document phase estimates shall conform with Uniformat II Level 4. Project cost control will be maintained to appropriate limits through the development of the project cost estimates. Resource loaded estimates are required for all submissions during this Phase. (See Appendix 8d)
1. **Post Backcheck CDs:** A final post-construction documents, project base estimate, shall be submitted in Uniformat II, conforming to Uniformat II, stage level 4 of completion.
 2. **Required Fields (Back-Up Worksheets):** Units, unit pricing, quantities, material, equipment and labor shall be clearly identified in supporting reports for Construction Documents phase reports. Lump sum pricing shall be held to a minimum. Include equipment costs in material field. Provide the following column fields:

a. Division of Work	f. Labor Cost
b. Quantity/Area	g. Labor Unit Cost
c. Units	h. Hours (Crew Hours)
d. Material Cost	i. Material & Labor Cost
e. Material Unit Cost	j. Material & Labor Unit Cost

8.5 COST MARKUPS & SOFT COSTS

- A. **General:** The AOC will identify the means of construction to be used for the project. Select the pricing method applicable to project delivery method, calculate mark-ups and implementation costs for the private general contractor method in the following sequence for all submission phases:
1. **Markups:**

a. <i>Direct Costs.</i>
Labor burden.
b. <i>Indirect Costs.</i>
Sub-contractor.
General Contractor.
c. <i>Construction Contingency.</i>

- d. **Implementation Costs.**
 Construction Administration.
 AOC Construction Management Fees.
 Government Testing, Inspection & Quality Control.
- e. **Project Design & Project Management**
- f. **Total Project Costs.**

2. **Format:** Format delivered summary reports in conformance with examples shown in the Appendix. For guidance, we recommend the following values by construction methods:

During early project phases develop unit costs from historical information or develop unit cost assemblies for the project at hand. Include basic resource loading with increasing levels of Uniformat II detail as the project advances.	General Contractor Built	CMD Construction Branch Built
DIRECT COSTS:		
Raw Costs: Materials (includes state sales taxes as applicable), equipment, wage rate and fringe (includes Difficulty Factor of 1.2 Minimum applied in Success Estimator Software).	X	X
LABOR BURDEN: Mandatory labor taxes & insurances.		
Off-Hour Costs: Night differential & premium time (define).	Varies	Varies
Labor Taxes & Mandatory Insurances:	X	N.A.
FICA:	N.A.	7.65%
SUB-CONTRACTORS:		
Sub-Contractor Overhead & Profit:	X	N.A.
Field Overhead: The cost for foreman and general foreman. (Calculate on labor costs only)	15%	N.A.
Home Office Overhead:	4%	N.A.
G.C. Profit: Generally enter at percentages of 6%, note any variances from these values and state justification. This amount should include values for General Conditions.	6%	N.A.
Bonds: Enter at 0.5% to 1.5%.	1%	N.A.
GENERAL CONTRACTOR:		
Field Supervision:	N.A.	12%
Field Overhead:	15%	N.A.
Home Office Overhead:	4%	N.A.
Wage Grade Loss of Productivity:	N.A.	2.36%
Profit:	6%	N.A.
Bonds:	1.5%	N.A.

A/E DESIGN MANUAL
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DESIGN CONTINGENCY: Design contingency lowers in value as the project advances and its definition is further refined. As rules of thumb, the AOC uses the following values:		
<i>Schematic:</i> Provide a contingency of between 20% to 25%.	X	X
<i>Design Development:</i> Provide a contingency of between 10% to 15%.	X	X
<i>Construction Documents:</i> Provide a contingency of 10% declining to 0% at final completion of construction documents.	X	X
ESCALATION:		
Tie escalation costs to published inflation values from Engineering News Record Cost Building Index (BCI). Carry costs to mid-point of construction period. Define dates, durations, multipliers, and compounded rate.	X	X
CONSTRUCTION CONTINGENCY:		
<i>Construction Contingency:</i> Provide range of 5% to 10% for new work, 10% to 15% for renovation work, based on construction costs.	X	X
PROJECT IMPLEMENTATION COSTS:		
<i>Construction Administration:</i> Provide range based on construction costs, and extent of services provided.	2.5% or as negotiated	2.5% or as negotiated
<i>AOC Construction Management Fees:</i> Construction management costs vary. Obtain recommendation from Technical Support.	8%	10%
<i>Government Testing, Inspection & Quality Control:</i> Provide at 1% to 2 1/2%, depending on complexity and number of tests required.	X	X
PROJECT DESIGN & PROJECT MANAGEMENT:		
<i>A/E Design Fees (Percentage of ECCC):</i>	10% or as negotiated	10% or as negotiated
<i>AOC Project Management Services:</i>	5% or as negotiated	5% or as negotiated
Program Total: (All Costs)	X	X

8.6 REPORTING FORMATS

- A. **Report Formats:** Comply with reporting formats specified in ASTM E-1804, providing the Cost Estimate report that contains a Title Page, Table of Contents, Task Outline, Project Description, Notes concerning the Estimate, Summaries, and Cost Comparison Summaries of Phases. Cover sheet, project identification, submission level, A/E, estimate firm and submission date are required.
 1. *Narratives:* Submit a project narrative with each phase estimate, describing the proposed scope and assumptions upon which the estimates are based. Project evaluation and

discrepancies will be clearly indicated during the stage estimating process. A scope of work summary shall accompany the final project base cost report. Clearly identify items not included or items furnished by others.

2. **Summary Reports:** Format estimate summaries in conformance with the Report Summaries included in the Appendices.
3. **Worksheets:** Backup worksheet estimates shall be arranged by cost categories with a summary sheet combining all category costs. Backup worksheets must represent all cost sensitive project data and define all major assumptions. Backup estimating data and quantity survey information may be in any format but shall be grouped under appropriate format classification headings.

8.7 DELIVERABLES

- A. **Printed Copies:** Bind data into 8½" x 11" printed report format. All estimate submission levels shall be bound together as a separate package from other estimate submission levels. The A/E shall use tabs to mark each major cost section.
 1. **Uniformat II:** Provide a minimum of 10 (ten) bound copies and one unbound original suitable for reproduction.
 2. **CSI MasterFormat:** Provide a minimum of 2 (two) bound copies and one unbound original suitable for reproduction.
- B. **Electronic Media:** Deliver electronic copies of all estimates, at each required phase of project design. Early phases may be delivered via E-Mail. The final Estimate (one disk for Uniformat II and one disk for CSI Masterformat) shall be delivered via 3½" floppy disk, CD ROM, or ZIP Disk, *Windows NT or XP* formats. Label disks with AOC Project Number, AOC Project Title, Task Order Number, AOC Contract Number, AOC Fiscal year, Date of estimate, and Firm Name and Estimator. File names shall use the AOC Project Number, an underscore and Estimate Number (01,02, etc.)
 1. **Software:** Submit in the *current version of Success* software.
 2. **Text and narratives:** *Word Perfect, Windows Write*, or ASCII text only. Documents forwarded in *other formats* will be returned unprocessed.

END OF PART 8

APPENDICES

3a	DOCUMENTARY PHOTOGRAPHY	1 page
4a	SAMPLE DESIGN REVIEW COMMENT SHEET	1 page
6a	SAMPLE OUTLINE SPEC	10 pages
6b	SOLE SOURCE JUSTIFICATION FORM	3 pages
7a	CAD LEVEL STANDARDS	22 pages
8a	PROJECT ESTIMATE (Small Projects)	1 page
8b	PROJECT ESTIMATE SUMMARY (Schematic Phase)	1 page
8c	PROJECT ESTIMATE SUMMARY (Design Development Phase)	2 pages
8d	PROJECT ESTIMATE SUMMARY (Construction Documents Phase)	3 pages

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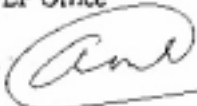
UNITED STATES GOVERNMENT
MEMORANDUM

ARCHITECT OF THE CAPITOL,
WASHINGTON, DC 20515

OFFICE OF THE ARCHITECT
SB-15 CAPITOL, S-1293

DATE: March 28, 1997

TO: Executive Committee Members and Division Heads; Building Superintendents; Supervising Engineers; Chief Engineer; Facility Manager; Landscape Architect; Executive Director, U.S. Botanic Garden; Director of Food Services, U.S. Senate Restaurants; and EEO/FEP Office

FROM: Alan M. Hantman, AIA 

SUBJECT: Documentary Photography

This is to remind all project managers that photographic documentation is an essential part of each project. I direct that photography be included in all project planning checklists and scheduling documents. This applies to construction projects throughout the Capitol complex as well as modifications to spaces in the Capitol. Not only the actual construction phase of the project, but also pre-existing conditions, site surveys, and other planning activities, including studies by consultants, must be documented by the AOC Photography Branch.

An important function of the AOC is to create and maintain a permanent visual history of architecture and events relating to the Capitol. Another of our functions is to compile and maintain complete room histories of the spaces in the Capitol; therefore, it is imperative that rooms and other spaces be documented before and after any structural changes, remodeling, or redecoration. Our agency has performed these functions well in the past, but the continued success of our mission depends upon your cooperation in the proper documentation of current and future projects.

I also wish to remind you that existing photography is a very useful tool in the planning stages of any project. A valuable resource available to you is the AOC photographic archive, which is located in the Photography Branch. This well-organized collection contains over 100,000 images dating from 1856 to the present. This archive contains photographs documenting the construction of all the major buildings in the Capitol complex as well as real property acquisitions, site surveys, underground utility installation and repair, and other projects and events. An electronic data base and staff are available to assist you with your research.

Early notification of the photography staff of upcoming construction is essential to enable them to address your needs and coordinate the photography required for your project. Please contact Mr. Wayne Firth at the Photography Branch in room SB-21 or call him at 228-3310 to discuss your photographic requirements.

APPENDIX 4a - SAMPLE DESIGN REVIEW COMMENT SHEET

Replace This With Project Title
XXX% SD/DD/CD Phase Submission Review
AOC Project Number XXXXX

Architect of the Capitol Comments					Consultant Comments			AOC
No.	Sect. No. - Draw. No.	Section Title - Drawing Number	Comment	By	Date	Response Comment	By	Back check
1	XXXXX	Sample Section Title	Paragraph Number or Detail Number and then the comment about the issues at hand. These fields will expand and wrap as required to suit each comment	XXX	xxxx	An appropriate response goes here.	XXX	XXX
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SAMPLE OUTLINE SPEC

The following outline specification is presented as a sample of an acceptable outline specification. As the sample has been edited to reduce the reproduction costs of this Appendix, it should not be viewed as being all-encompassing in scope or as representative of a complete project specification. The sample is commended for its clarity, brevity, and clear organization that closely tracks the resulting final project specification. The project was a multi-million dollar office building.

DIVISION 2 - SITE WORK

Demolition

- Paving, curbs, site improvements.
- Concrete slabs, foundations, footings....

Site Clearing

- Protection of Existing Trees: As directed.
- Removal of trees and other vegetation.
- Removing of above-grade improvements....

Excavation and Fill

- Relocation of active underground utilities to be relocated by Contractor before major excavation begins.
- Basements, footings, foundations, elevator pits, beams, shall include all soil, rocks, vegetation.
- Shoring and sheet piling....

Dewatering

- Observation wells & pump and well points.
- Maintain excavations and basement free of water.

Landscape Work

- Trees, shrubs, ground cover planting, lawns, topsoil, mulch, planting soil, m fountains, and benches.
- All landscape activities must be consistent with the AOC Master Plan and coordinated with the AOC Landscape Architect for the Architect.

Curbs, Walks, and Pavings

- Granite Curbs: To match existing.
- Concrete Vehicle Paving and Walks: Steel trowelled and broomed....

DIVISION 3 - CONCRETE

Description of the Proposed Structural System

- The building will be a concrete framed fireproof structure utilizing 8" thick flat-plate construction with typical 20' X 20' bays allowing the maximum floor load of 100 psf for live load and 20 psf for interior partitions....
- On the basis of the preliminary soils report, the structure will be supported on spread footings with a typical underslab drainage system.

Concrete Formwork

- Exposed Concrete: Smooth form, rubbed finish.
- Concealed Concrete: as cast.

Concrete Reinforcements

- ACI 301, 315, and 318. Yield Strength: 60,000 psi, ASTM A615 for

Cast-In-Place Concrete

- Heavy Aggregate: 150 pcf concrete, 3,000 psi unless otherwise noted
Foundations, grade beams, pits.
Basement floors, walls, columns and floors....
- Exposed Interior Concrete Floors: Dust on hardener, seal with FS TT-C-800, type 1, liquid cure and seal.

DIVISION 4 - MASONRY

Concrete Masonry Units

- Type: 95 lb/cf, hollow load bearing meeting ASTM C-90, Grade U-1, 1-hour UL rated.
Reinforcement: Truss or ladder, 9 ga. main wires continuous spaced 16" o.c. vertically, lap at junctions.

Stonework

- To match Building X exterior stone walls in color and texture. Mock-up required to show all proposed shapes.
Testing of stone for compressive strength, modulus of rupture, absorption and specific gravity.
Anchorage: Stainless steel angles with adjustable bolts. Stainless steel stone anchors, dowels, cramps complying with ASTM A167, type 304. Certify anchorage systems. Submit engineers calculations.
- Points: Point with polysulfide or silicon sealant.
- Thinbed epoxy at counters. Polysulfide sealant at joints.

DIVISION 5 - METALS

Structural Steel

- Beams ASTM A36
- Shop Primer: Prime columns and beams only where steel exposed. Prime steel joists and bridging. Use SSPE Paint 5-64T, iron oxide, oil, alkyd primer.
- Connections: Bolted ASTM A325, welded ASTM A233.

Metal Roof Deck

- Galvanized Steel: ASTM 245 or A446.

Fabrications

- Ladders: To penthouse roofs, pits and mechanical levels, aluminum where exterior.
- Gratings: Areaways, aluminum....

Steel Stair Systems

- Fire Stairs: Steel and concrete filled treads and landings, closed risers, concrete filled landings 1 1/2 galvanized pipe rail both sides to code. Stair to extend to roof hatch.

Ornamental Metal

- Handrails, gates and art works at main lobbies: Polished architectural bronze, heavy clear lacquer coated.

DIVISION 6 - WOOD

Carpentry

- Treated wood for preservation and fire resistance, framing, blocking, shims, rough bucks, furring.
- Shelving: Painted wood shelving in storage areas.

Plastic Laminate Casework

- Prefabricated modular cabinetwork, no particle board due to Formaldehyde content, plastic laminate finished.
- Location: Work rooms, coffee bars, snack bar/carry-out, and storage areas.

Architectural Woodwork

- Hardwood (white oak, typical).
- Plastic laminate counter tops.
- Railings, natural hardwood, paneling, cabinetwork, natural finish.
- Prefinished Cabinetwork, Paneling, Build-in Furnishings, Doors, Fixturework and Equipment: AWI "Premium" workmanship, matched veneer.
- Finish: Natural, matched finish wood veneers, prefinish in shop, AWI "Premium" finish #1, 4 coats lacquer.

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

Elastic Waterproofing

- EPDM, butyl sheet. 50 mil where exposed.

- Location: At basement floors under concrete. On outside of basement walls.

Insulation, Thermal

- To achieve a "U" factor of .10 for walls, .05 for roofs. Inorganic fiber and foam roof board, if used, shall be solid mopped to roof deck. Glass fiber board or batts at all exterior walls and soffits separating air conditioned space from exterior.
- Firestopping: Meet U.L. fire rating for wall, floor or ceiling.

Elastic Sheet Roofing

Single ply EPDM, bar-anchor, white color, 60 mil min. on roof insulation. 10-year full warranty.

Flashing and Sheet Metal to SMACNA Standards

- Metal Flashing and Trim, Metal Gutters, Downspouts, Gravel Guards, Scuppers and Parapet Cap: Stainless steel.

Copper Roofing

- 24 ounces per sq. ft. (20 gauge) standing seam roof with width between seams as shown on drawings.

Roof Hatch

- Type: Prefab, 8" metal curb type. 14 ga. gsm cub. 11 ga. aluminum cover, exterior grade anodized finish, counterbalanced. Insulation - 1" urethane.

Sealants

- Type: Polysulfide, polyurethane, silicone. Color - To match adjacent surfaces.
- Location: Between dissimilar materials on exterior walls, joints in exterior and interior exposed surfaces.
- Joint Filler, Gaskets and Back-up: Plastic expanded closed cell.

DIVISION 8 - DOORS AND WINDOWS

Hollow Metal Doors and Frames

- Typical Size: 3'0" x 8'0".
- Factory primed, 16 ga. s.m. interior, galvanized, 14 ga. s.m. exterior.
- Fire rated at exits, mechanical rooms, stairs.

Doors and Frames at Interior Entrances and Elevator Lobbies

- Metal and Hardware: Polished architectural bronze, clear lacquered, or stainless steel.
Hardware: Pivots, LCN concealed closers on formal corridor doors, surface-mount closers on service spaces, fire towers, etc., locksets, push-pulls, and threshold, cast iron cylinders for all closers.
- Clear tempered glass in doors and sidelights.

Wood Doors

- Natural factory finished solid core.
- Natural Veneer: White oak. Lifetime warranty against defects including warpage. Fire-rated at corridors and as required to meet codes. Finish - AWI #1, 4 coats lacquer.

Windows and Storefront

- Aluminum, fixed, anodized exterior grade anodized finish.
- Sized to withstand wind loads as defined by Factory Mutual and deflect less than 1/175th span.
- Windows shall meet ANSI/AAMA standards for air and moisture infiltration.

Finish Hardware

- Lock and Latchset Design: Lever handle, heavy-duty mortise, meeting handicapped requirements.
- Hinges: 3 knuckle ball-bearing with closers, butts elsewhere. Heavy duty.
- Closers: Surface-mount on service spaces, fire towers, etc. Cast iron cylinders.
- All Exposed Metal: Matching polished architectural bronze with heavy clear lacquer finish.

Door Stripping, Seals and Thresholds

- Weatherstripping including thresholds, jambs and head at exterior HM doors. Soundstripping including automatic drop seal at soundproof walls including mechanical and machine rooms.

Glass and Glazing

- Windows, doors, entrances, storefronts.
- Float Glass: Clear

- Tempered Glass: Clear, at interior and exterior entrances and room dividers.
- 1" insulating glass, heat strengthened glass to meet "U" factor requirements for allowable heat loads and energy conservation. Location: Typical exterior windows. Thickness of glass according to code to meet wind loads.
- Glazing: Sealants, polysulfide, acrylic, tape, neoprene and vinyl extrusions.

DIVISION 9 - FINISHES

Metal Furring and Lathing

- Plaster base 3/4 painted lath, galvanized at exterior. Painted steel channel furring, galvanized at exterior. Tie and hanger wire, galvanized.
- Wall, ceiling and soffit framing to receive plaster.

Plaster

- Portland cement, 3 coat on metal lath at exterior walls and soffits and at other damp locations. 2 coat on masonry. Finish - Machine medium texture, no sand finish.
- Gypsum plaster at interior dry locations.

Gypsum Drywall System

- Wall and ceiling framing systems, including 25 ga. galvanized steel screw studs, furring members to receive gypsum drywall.
- Gypsum Board: Fire rated, moisture resistant at damp locations, laminated core board, 5/8" thickness typical.
- Walls Extending to Structure Above: Exterior walls, shafts, mechanical and machine rooms, corridor walls, soundproof walls, fire walls.

Ceramic Tile

- Ceramic tile walls over CMU.
- Unglazed ceramic mosaic at floors of public and private toilet and shower areas, fixture walls and floors.
- Marble thresholds at toilet rooms. Trim shapes including cove and bullnose.
- Mortar and Grout: Latex/cement type. Thickbed where slope to drain of floor desired. Thinset on floors and walls typical.

Acoustic Ceilings

- Lay-in ceiling (2'x2') accessible acoustic tile, medium fissured. Location: Office areas and non-public locations.
- Drywall ceiling or concealed spline (12" x 12") accessible acoustic tile, medium fissured beveled edges. Location: Entries, public lobbies.

Resilient Floors

- Vinyl Composition Tile: 12" x 12" x 1/8" homogeneous terrazzo or marble pattern. Location: Utility floors not carpeted, including print center, and storage areas.
- Resilient Base: 4" x 1/8" thick vinyl or rubber, solid color, coved except at carpet. Location: All wall/floor junctions except masonry. Straight at carpets, coved at others.

Carpeting

- 100% nylon, 3-ply dense cut, 270 pitch, .1 ga. polypropylene jute backing. Base Building Corridors: Pile height, .250 in., 32.0 oz. face weight. Offices: Pile height .317 in., 36.0 oz. face weight.

Painting

- Paint all normally painted items including interior and exterior surfaces, exposed mechanical and electrical equipment, pipes, ducts, conduits, garage, mechanical spaces and stairs.
- Typical finishes include:

Painted Wood	3 coats eggshell enamel
Gypsum Board	3 coats eggshell latex enamel
Concrete, Masonry, Plaster	3 coats eggshell latex enamel
Wood (natural)	4 coats lacquer, AWI #1
Metal	3 coats eggshell latex enamel
Pavement Lines	1 coat traffic marking paint

- Color Selection: Maximum 12 custom colors.

DIVISION 10 - SPECIALTIES

Toilet Partitions

- Ceiling hung toilet partitions. Flush construction. Wall hung urinal screens. Finish: Baked enamel galvanized steel.
- Shower partitions for service staff.

Architectural Louvers

Aluminum - extruded aluminum, exterior grade anodized finish, bronze bird screen.

Toilet Accessories Catalog number from Bobrick Washrooms equipment (function reference only).

- Material: 22 ga. stainless steel, satin finish.
- Public Toilets:
 - Towel Dispenser and Waste Receptacle: B-360 (recessed). One (1) per toilet room, except as noted.
 - Liquid Soap Dispenser: B-8205. At each lavatory.
 - Toilet Tissue Dispenser: B-275 (surface). At each water closet.
- Waste Receptacle: B-275 (surface). At private only.
- Napkin Dispenser: B-352 (recessed). At women's only....

DIVISION 11 - EQUIPMENT

Dock Bumpers

- Laminated tread, 13" x 24" high, truck tires compressed in structural galvanized angle and bolts.

Dock Leveler

- 6' long x 7' wide, 20,000 lb. capacity, recessed in loading dock. Adjustable manually to 24" above/below dock. Structural steel frame and tread plate.

DIVISION 12 - FURNISHINGS

Horizontal Louver Blinds

1" mini-blinds, anodized aluminum. Manual lift and adjustment.

DIVISION 14 - CONVEYING SYSTEMS

Passenger Elevators

- *Number:* Twelve (12) passenger elevators in two separate banks of which one in each bank shall be convertible to a service elevator. Separate elevators required from the ground level to all garage floors.
- *Type:* Gearless traction.
- *Speed:* Maximum time for any elevator to be running between highest and lowest floor shall be 60 seconds. Maximum waiting time at each floor serviced shall be 30 seconds at each bank of elevators. Minimum number of building occupants served in any 5 minute period shall be 12% of the total occupants of the building.
- *Occupant Load:* 250 gsf/person.
- *Doors and Frames:* Center opening. Stainless steel doors, bronze frames and trim.
 - Frame Size: 3'6" x 9'0".
 - Door Size: 3'6" x 9'0" with flush transom full height at Ground Level.
- *Operation:* Group automatic, supervisory, zoned.
- *Clear Cab Height:* 9'0"....

DIVISION 15 - MECHANICAL, PLUMBING AND FIRE PROTECTION

MECHANICAL

Description of the Proposed HVAC System for the Sample Office Building

- The exterior zone system is generally described as a four pipe fan coil type. Exterior areas are conditioned by console type fan coil units with hot water heating coils, chilled water coils, two way automatic valves, and wall mounted room thermostat. Exterior zone areas are approximately 150 square feet each with each zone extending ten linear feet along the perimeter and fifteen feet in depth. Each of these exterior zones will have its own individual thermostat to control heating or cooling at the occupants selection. Ventilation air will be provided from the interior zone system and will be discharged overhead through air boots connected to recessed ceiling light fixtures.
- The interior zone system is generally described as a low pressure, constant volume, variable temperature type. Interior areas are conditioned by multiple low pressure four pipe air handling units located in mechanical equipment rooms on each floor. Air is ducted from the air handling unit through a low pressure duct distribution system to air boots connected to recessed ceiling light fixtures. Interior zone areas will not be greater in area than 15,000 square feet. Each of these zones will have one thermostat that will sense the average return air temperature which will determine the temperature of air that the air handling unit will deliver. Air is returned into the return air ceiling plenum by return air light fixtures or lay-in ceiling diffusers.
- Areas of the building with defined variable air conditioning loads will be provided their own independent conditioning system. Independent systems will also be provided for spaces that will be used during off hours.
- Chilled water and steam will be provided to the site by the Capitol Power Plant System...
- The building HVAC control systems will be of the direct digital electronic type which will be compatible with the existing Capitol Complex system for computer control of the environment within the building.
- Ventilation air will be provided to all occupied spaces at a rate that will meet or exceed ASHRAE standards at a minimum rate of 20 cfm per person. Exhaust air will be provided to garages, storage rooms, toilet rooms, and other areas required by code, and to dissipate heat generated by equipment.

Design Conditions

The air conditioning system will be designed to maintain temperatures and humidity at the condition stated under Design Criteria.

Energy Efficiency

- The building systems shall be designed to meet or exceed the energy efficiency standards established by the current ASHRAE Energy Guidelines and occupant comfort described above.

Chilled Water and Heating System

- Chilled water and steam will be supplied from the central plant located off-site. All necessary pumps, heat exchangers, tanks, central monitoring and control systems and auxiliary equipment will be located in a central mechanical area within the building. Chilled water from the Capitol Power Plant must be used in accordance with CPP design criteria,

System Zoning

- A multiple zoned conditioned air circulating system shall utilize ceiling plenum air return, supply air saddles on light fixtures for interior zones and perimeter fan coil units air slots for exterior zones. The maximum zone size for the interior shall be 15,000 square feet and exterior perimeter zone shall be approximately 150 square feet.

Controls

- All controls shall be direct digital except the perimeter fan coil units which shall be electric with night-time override. Perimeter fan coil units shall be placed approximately every 10 feet along the perimeter...

Pumps

- Pumps shall be centrifugal, horizontal split case double suction type or end suction type similar to Ingersoll-Rand. Pumps shall be tested at one and one half times rated pressures, but not less than 175 psig. ...

Air Handling Units

- Equipment shall be designed for high acoustical performance and energy efficiency. All motors with variable

loads or variable air flows shall be capable of adjusting to the demand.

Piping

- In general all piping shall be Schedule 40 black steel with threaded or welded fittings or Type L copper. Dielectric fittings shall be used at all junctions between dissimilar metals. Extra heavy pipe shall be used for steam condensate piping, and Schedule 80 steel or Type L copper pipe shall be used for chilled water piping 2" and smaller.

Valves

- Provide isolation valves at all equipment and each major piping branch. Valves shall be rated bubble tight for dead end shut-off. Valves in flanged pipe shall be full lug body.

Ductwork

- All main distribution ductwork shall be galvanized steel joined, fabricated and installed according to SMACNA standards.

Grilles and Diffusers

- For interior zones, provide light fixture air supply saddles or lay-in ceiling diffusers.

Insulation

- All insulation shall be selected based on the service temperatures and ambient temperatures. Materials and thickness shall provide insulating value as recommended by the material manufacturers for optimum cost effective performance.....

Automatic Temperature Controls

- A complete direct digital control and monitoring system consisting of room temperature sensors (thermostats), controllers, dampers, motors, control valves and operators, monitors, local control panels, relays, switches and all necessary accessories and training. The system shall be capable of monitoring and controlling all control zones, operating equipment, power demand and consumption and alarm conditions.

Fans

- Supply, exhaust, and return fans shall be sized for the design load and have spare capacity to accommodate normal additions to the systems.

Noise and Vibration

- All equipment shall be designed, selected and supported to minimize the transmission of noise and vibration. Noise levels in the occupied space shall not exceed an NC35 as a result of any equipment or systems within the building. Vibration isolation shall be utilized with all rotating or vibrating equipment or systems.

PLUMBING Description of the Proposed Plumbing System for the Sample Office Building

Domestic Water System:

- Provide a connection with water meter and vault to the local water utility mains in the street, (including non-metered fire service) through which a complete water distribution system will be supplied. This system will consist of two (2) independent water pressure zones.
- The office towers will be supplied using a domestic water booster pump system and a vertical and horizontal up-feed type distribution system to fixtures and equipment. Hydro-pneumatic storage tank will be provided in penthouse to allow the domestic booster to shut-down during no demand periods.
- Domestic Hot Water System: Hot water will be supplied from a central water heating system using district steam through a steam to water convertor, auxiliary storage tank and hot water circulation pump, and hot water mixing valve for temperature control.

Plumbing Fixtures

- Plumbing fixtures, floor drains and equipment below sanitary sewers shall be arranged for gravity flow into a pumped sewage ejector system. The discharge from ejector pumps shall connect to the building gravity sewer system.

Storm Sewer System

- The storm sewer drainage system from all roof areas, balconies and mechanical equipment shall be arranged for gravity flow into public storm sewer in street.

Domestic Cold Water and Controls

- Provide a domestic water pressure maintenance system consisting of a prefabricated, two pump (minimum) water pressure booster system with factory precharged hydropneumatic tank and controls. The system shall be capable of automatically providing the required system pressure and flow during normally occupied or unoccupied conditions without short cycle, essentially no flow pump operation.

Domestic Hot Water

- Water heaters shall be located and piped to supply all lavatories, janitor sinks and hot water requirements with a ten second maximum flow time before tap water is at design temperature. Water heating is to be supplied by Steam Heat Exchangers. Where it is impractical to supply hot water by Steam Heat Exchangers, electric hot water heaters may be used.

Piping

- *Domestic Water:* Copper tube, type L with wrought fittings all sizes up to and including 4" diameter, schedule 40 galvanized steel pipe 5" diameter and larger. All exposed piping in kitchen and bathrooms shall be chrome-plated.
- *Storm, Waste and Vent:* Service weight cast iron.
- *Fire:* NFPA standards, UL listed, F.M. approved for sprinkler and standpipe, dry sprinkler system piping, galvanized steel meeting ASTM A-795.....

FIRE PROTECTION SYSTEM

Description of the Proposed Fire Protection System for the Sample Office Building

- Sprinkler System: The building shall be protected with a completely automatic wet pipe sprinkler system. All occupied and unoccupied areas shall be protected.

Dry Sprinkler System:

- All areas subject to freezing conditions shall be protected with completely automatic dry pie sprinkler system.

Standpipe System:

- Standpipe risers shall be installed in all stairwells including fire department hose valves for each floor level. Interconnect all standpipes at their base. Connect fire department siamese connections to standpipe supply piping. Interconnect all siamese connection within building.

Fire Pump:

- Provide a complete automatic electric motor driven fire pump, include all required accessories such as automatic controller with automatic transfer switch, jockey pump and automatic controller, flow-meter testing system and fire pump test manifold.....

Building Smoke Control System:

- **Stair Pressurization:** An automatic stair pressurization system will be provided for each stairwell in the building....

DIVISION 16 - ELECTRICAL AND COMMUNICATION

Description of the Proposed Electrical System for the Office Area of the Sample Office Building

- Office area of the building will be served by four vertical bus duct risers with total capacity of 9 watt/s.f. connected to switchboards in main switchgear room. Tapped from each riser in each core will be a 480/277 volt lighting panel which subfeeds a transformer serving 120/208 volt receptacle panel.
- Specialty areas such as print shop and computer rooms will be served by individual feeders. These panels will be connected through distribution panels to main switchgear.
- Mechanical equipment will be served by distribution panels and motor control centers connected to 480 volt distribution system.
- Lighting will be achieved by means of three lamp 2 x 4 luminaries with aluminum parabolic louvers generally located at one per 80 sq.ft. in office areas and in accordance with IES and architectural requirements. Lobbies and public areas shall be in general designer lighting utilizing incandescent downlights and wall washers. All

lighting shall be switched. Presence sensors, if required, shall be installed in garage, toilet and some corridor lighting for the purpose of energy conservation.

- Fire protection system will be multiplex voice fire alarm in accordance with 1987 BOCA Code. Annunciator panel and controls shall all be located in fire control room on first floor.
- Emergency system will consist of 120/208 volt and 480/277 volt panel boards located in penthouse and in switchgear room. System shall serve one elevator in each bank, required lighting, fire alarm system and required smoke fans, fire pump, sump pumps and sewage ejector. System shall be connected through automatic transfer switches to emergency generator. Emergency circuits will be terminated on loft space floors for future layouts. Emergency generator system to be entirely separate from data processing standby system.
- Entire building will be protected by a master labeled lighting protection system.

Design Criteria

- Tenant Available Power:

Lighting load	2.25 watts/square foot
Office Equipment load	120/208 V power, 3 watts/square foot
- In each riser, 2 watts per square foot spare capacity for future special tenant loads shall be provided. Vertical distribution will consist of 4 bus duct risers with 4 electrical closets per floor. Each closet shall contain 480/277 volt panel, step down transformer and 120/208 volt panel. Each panel shall contain 100% spare quantity of circuit breakers.
- Emergency Power: The Architect of the Capitol will specify the total amount of emergency power that will be made available for tenant use based on .15 watts per square foot.

Utility Services

- Electrical services for the project shall be rated 460/265 V, three phase, four wire, obtained from PEPCO vaults located adjacent to the building. Service entrance location shall be coordinated with the power company.
- Telephone service for the project shall be via underground ducts from the location designated by the AOC.

Power Distribution

- All main switches and feeder switches 800 ampere and above shall consist of bolted pressure switches with ground fault protection, three phase, blown fuse protection and indicator lights. All bussing shall be copper.
- The building electrical system shall be designed around the parameters listed in "Design Criteria" above and in accordance with NEC. Spare capacity will be provided in service and switchboards equal to 50% of base tenant installed capacity.
- Power distribution to typical tenant floors shall consist of feeder/plug-in busway risers from the main switchgear serving 460/265 volt panel boards at each floor via fused bus plugs. Dry type transformers (low noise level with 220 C degree insulation but applied at 80 C rise), fed via fused bus plugs, shall be provided to supply 120/208 volt panel boards at each floor. The transformer shall supply the 120/208 volt panel boards located on the same floor. Panel boards shall be located in the electrical rooms.
- Lighting and receptacle branch circuits in interior dry, furred spaces, shall be serviced by type MC cable where permitted by NEC.
- Receptacle circuits shall have no more than five receptacles on a branch circuit breaker. Floor air conditioning equipment shall be circuited through contactors (or controlled by the building automation system) for control by the fire alarm system.

Telephone Distribution

- A conduit and sleeve system shall be provided from the main telephone terminal room to plywood telephone terminal boards located throughout each floor.....

Emergency Power System

- Emergency power shall be supplied from a diesel-driven engine generator set complete with prime mover, generator controls, starting equipment, exhaust system, automatic transfer switches and all necessary auxiliaries. Generator shall be located in a dedicated room on the roof or basement level as design dictates....

Fire Alarm System

- The system shall be a combination alarm and voice communication fire alarm system consistent with the system requirements of the Architect of the Capitol and in accordance with 1987 BOCA Code.
- Manual pull stations shall be located adjacent to each exit stair entry on typical tenant floors and in the path of

egress as required per NFPA 101....

- Photoelectric type smoke detectors shall be located in rooms containing equipment vital for life safety, elevator lobbies, and in duct work at HVAC equipment as required by NFPA 101, NFPA 72E, and NFPA 90A.
- Fixed temperature/rate-of-rise detectors shall be provided in rooms where a smoke detector is unsuitable due to the environment unless rooms are protected by sprinkler heads....

Lighting System

- Lighting levels shall be in accordance with the Illuminating Engineering Society (IES) recommendations for the specific areas.

Grounding Systems

- System Grounding: A driven electrode grounding system will be provided to supplement the water main ground. The system will be designed to limit the grounding system resistance to less than 25 ohms.
- Equipment Grounding: All non-current carrying metal enclosures, structures, boxes, cabinets, machine frames, portable equipment and piping systems will be connected to the grounding system.
- Derived neutrals will be grounded at the supply side of the main circuit breaker or at the neutrals of related transformers.
- Separate grounding conductors will be provided for all feeders and motor circuits.
- The completed equipment grounding system shall be subjected to a meggar test at each main distribution switchboard and ground bus to insure that the ground resistance of the system without chemical treatment or other artificial means, does not exceed 25 ohms.
- Lightning Protection: A UL Master Label C lightning protection system shall be provided to protect the entire building.

**JUSTIFICATION FOR SOLE SOURCE PRODUCTS --
EXPLANATION OF SOLE SOURCE CIRCUMSTANCES**

Keep in mind:

- ✓ Lack of planning does not support sole source.
- ✓ Expiring funds/late release of funds does not support sole source.
- ✓ The authorized technical requestor is required to ensure that sole source justifications are adequately documented and must be able to certify the accuracy and completeness of the data included in this justification.
- ✓ The authorized technical requestor or a Jurisdiction/Division/Office Official as defined in *AOC Memorandum, Authorization of Purchase Requisitions, July 18, 1984* must certify and sign each sole source justification.

A. The following are examples of the bases of sole source acquisitions

- (1) The products to be acquired are unique to a manufacturer.
- (2) Time is of the essence and only one known source can meet the Government's needs within the required time frame.
- (3) Data is unavailable for a competitive procurement.
- (4) It is necessary that the item being acquired from the one source be compatible and ~~and~~ interchangeable with existing equipment.

B. The following elements must be addressed in the sole source justification

- (1) State clearly the Government's requirements. Make sure that the entire requirement is covered by the justification.
- (2) Explain why the manufacturer/products is the only one that can meet the Government's requirements. For example:
 - (a) The manufacturer/product has a unique capability. The unique characteristics must be set forth.
 - (b) If only one manufacturer/vendor can perform within the required time frame, the time frame must be explained:
 1. Provide the date by which the product must be delivered.
 2. Indicate how that date was determined and its significance.
 3. Indicate the impact of delay in terms of program schedules, milestones, etc.
 4. State how long it would take another manufacturer/vendor to acquire the capability to perform , how much it would cost another contractor to get up to speed. State the basis for these estimates.]
- (3) State how the decision to go sole source was reached.

Architect of the Capitol, Procurement Division, 7/24/02 Rev.

JUSTIFICATION FOR SOLE SOURCE PRODUCTS

COMPLETE THIS FORM IN ITS ENTIRETY, EVEN IF THE RESPONSE IS "NOT APPLICABLE"

1. PRODUCT NAME (Include Specification Section)

2. PRODUCT DESCRIPTION (Manufacturer/Dealer Information, Model, Physical Characteristics)

3. ESTIMATED COST AND DELIVERY REQUIREMENTS

4. SOLE SOURCE INFORMATION (*Refer to "Explanation of Sole Source Circumstances" sheet.*)

5. **MARKET SURVEY.** Use internet searches, product literature reviews, or contact sources over the phone to identify which companies can provide similar products.
- a. Describe market survey conducted. Include companies contacted and relevant information.
 - b. If sole source is based on propriety data, a market survey is not required.

6. **ADDITIONAL FACTS.** This applies primarily to sole source requirements, but any additional information supporting urgency not previously addressed elsewhere in the document can be included in this section.

7. **FUTURE COMPETITION.** Provide information on the steps you are taking to ensure that the next time you need the item it will not be a sole source procurement.

CERTIFICATIONS

I CERTIFY THAT THE FACTS AND REPRESENTATIONS SUPPORTING THIS JUSTIFICATION ARE COMPLETE AND ACCURATE.

A/E (Sub)Consultant

Name and Title:

Signature:

Date:

Authorized Technical Requestor Or Jurisdiction Official

(Do Not Write In Shaded Area - AOC's Use Only)

Name and Title:

Signature:

Date:

APPENDIX 7a - CAD LEVEL STANDARDS

Introduction

The use of differing layers or levels in drawings supports uses far beyond that of simply keeping various types of lines separate. It serves to group information in settings that support future manipulation (copying, rotating, mirroring, etc.), without affecting other data that may be in close proximity. It facilitates multiple use of single drawings by permitting unneeded levels to be turned off when different plot results are desired. The use of levels supports increased display speeds by allowing you turn off unneeded levels and save the time required to display them every time a zoom or window is performed.

Previously the AOC utilized all of the defaulted level schemes originally furnished by Intergraph Corporation. With the advent of Bentley *MicroStation V8* the level schemes have both opened up and have allowed the AOC to adopt most of the *National CAD Standard* naming conventions. The National Institute of Building Sciences serves as the secretariate for the standards. To the extent possible we have attempted to honor both the new level names while preserving the older number schemes. Where the *National CAD Standard* has not addressed a level/layer name, the AOC has taken guidance from the *Tri-Service Standards*.

- **Summary of Changes:** The use of existing level 4, Building Outline, and existing level 58, Engineering Notes, has been mapped consistently across all disciplines to the extent practicable. Additionally, layers for New and Demolition work have been added within the Mechanical discipline and have been mapped to levels above the traditional 63. Existing work continues to reside on the number/named levels that it had previously. Most additional renaming has been “house-keeping” in nature to assure that only one name is associated with a level on drawings likely to be referenced or copied between files. It is anticipated that additional revisions will accrue as we use the software.

In engineering environments that utilize *MicroStation TriForma* software, these leveling schemes MUST be adhered to as the software uses levels to key data manipulation for some commands.

General rules are as follows:

- The levels apply throughout the entire system within each discipline.
- Use Level 61 for construction lines or non-print data.
- Levels for dimensions, notes, titles, etc., are consistent between disciplines.

The Technical Support Division will make *MicroStation* compatible sidebar menus supporting the AOC level scheme available to any consultant upon request.

ARCHITECTURAL FLOOR PLANS

Name	Level	Description	Color	Weight	Code
A-ANNO-TTLB	1	DRAWING SHEET EDGE & LINES	6	CELLS	CELLS
A-PLAN-KEYP	2	GRAPHIC SCALES & NORTH ARROWS	3,4	CELLS	CELLS
A-ANNO-TEXT	3	TITLE BLOCK TEXT	3,0	CELLS	CELLS
A-BLDG-OTLN	4	BUILDING OUTLINE (Footprint)	12	2	0
A-FLOR-AREA	5	ROOM PERIMETER SHAPE	5	2	0
A-FLOR-OTLN	6	EXTERIOR PERIMETER SHAPE	7	2	0
A-RSRV-7	7	RESERVED (BEAM EDGES)			
A-GLAZ-CWCL	8	CURTAINWALL CENTERLINE	1	0	4
A-GLAZ-CWMG	9	CURTAINWALL MULLIONS & GLASS	4,0	0,1	0
S-GRID	10	COLUMN GRID (CENTERLINES ONLY)	2	0	4
S-GRID-IDEN	11	COLUMN GRID TAGS	2	1	0
S-COLS	12	COLUMNS	4	CELLS	CELLS
A-WALL-PRHT	13	INTERIOR WALL EDGES (PARTIAL HEIGHT)	140**	1	0
A-WALL-CAVI	14	CAVITY WALL EDGES	140**	1	0
A-WALL-EXTR	15	WALL EDGES, EXTERIOR	140**	1,3	0
A-GLAZ	16	WINDOWS, WINDOW SILLS	4	CELLS	CELLS
A-FLOR-IDEN	17	ROOM NAMES & UNDERLINES	2	CELL	CELL
A-FLOR-SHFT	18	SHAFTS	3	0	0
A-FLOR-ELVR	19	ELEVATORS & ESCALATORS	3	CELL	CELL
A-FLOR-STRS	20	STAIRS & HANDRAILS	4	VARIES	0
A-WALL-MOVE	21	MOVABLE WALLS/PARTITIONS		1	0
A-FLOR-LEVL	22	SLABS, LEVEL CHANGES, RAMPS, ETC.	6	0	0
A-WALL-CLNG	23	INTERIOR WALL EDGES (CEILING HEIGHT)	140**		0
A-WALL-FULL	24	STRUCTURAL WALL EDGES (FULL HEIGHT)	140**		0
A-DOOR	25	DOORS AND DOOR SWINGS	4,0	3,0	0
A-WALL-JAMB	26	DOOR FRAMES	4	1	0
A-FLOR-SIGN	27	ARCHITECTURAL SIGNAGE			
A-STAT-NEWW	28	NEW WALLS - RENOVATION	7	2	0
A-STAT-DEMO	29	DEMOLITION - (WALLS & PARTITIONS)	7	1	3
A-FLOR-PFIX	30	PLUMBING FIXTURES	4	CELLS	CELLS
A-FLOR-TPTN	31	TOILET PARTITIONS & HANDRAILS	2	0	0
A-FLOR-SPCL	32	ARCHITECTURAL SPECIALTIES	7	CELLS	CELLS
A-FLOR-PATT	33	FLOOR PATTERNS, TILE, ETC.	9	CELLS	0
A-FLOR-WDWK	34	ARCHITECTURAL WOODWORK	3	1	0
A-FLOR-CASE	35	ARCHITECTURAL CASEWORK/MILLWORK	2	1	0
A-FLOR-EQPM	36	EQUIPMENT (XEROXS, COMPUTERS, ETC.)	2	CELLS	CELLS
A-FLOR-NICN	37	EQUIPMENT (OWNER FURNISHED)	2	CELLS	CELLS
A-FLOR-CURB	38	CURBS, PADS, RAISED SLAB AREAS	0	1	0
A-FLOR-OVHD	39	CEILING REFS (OVERHEAD - SOFFITS, ETC.)	4	0	2
A-ANNO-SYMB	40	SYMBOLS, BUBBLES, TARGETS, ETC.	2,3	CELLS	CELLS
A-ANNO-MATC	41	MATCH, BREAK, & CENTERLINES	3	4/0/0	0/4
A-DOOR-IDEN	42	DOOR SYMBOLS (NUMBERS)	CELL	CELL	CELL
A-GLAZ-IDEN	43	WINDOW SYMBOLS (NUMBERS)			
A-WALL-FIRE	44	WALL FIRE RATINGS	0	VARIES	SYMBOL
A-ANNO-ROOM	45	ROOM NUMBERS	2	1	CELL
A-ANNO-NOTE	46	NOTES, MISC. TEXT & LEADER LINES	3	1	0

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A-DETL-TITL	47	DETAIL TITLES, SCALES, & BUBBLES	3	CELLS	CELLS
A-ANNO-SCHD	48	LEGEND & SCHEDULES (LINES & TEXT)	0,6	CELLS	CELLS
A-IDEN-PRSL	49	<i>LARGE ROOM PRESENTATION NUMBERS</i>	0	0	FT=189
A-ANNO-DIMS	50	DIMENSIONS & WITNESS LINES	4,0	1,0	STYLE
A-USER-51	51	User definable.			
A-USER-52	52	User definable.			
A-FLOR-RAIS	53	RAISED FLOORS	5	0	0
I-FURN	54	FURNITURE GRAPHICS - EDGES	12	CELLS	CELLS
I-FURN-IDEN	55	FURNITURE TAG-NUMBER	7	1	FT=1
I-FURN-CLER	56	FURNITURE CLEARANCES	0	0	2,3
A-CLNG-GRID	57	CEILING GIRDS/FIXTURES	9	1	0
A-ANNO-ENGR	58	REFERENCE NOTES - ENGINEERING			
A-ANNO-KEYN	59	KEYNOTES & SPEC. SECTION NUMBERS	0	1	0
A-WALL-CNTR	60	WALL CENTERLINES (APPLICATION)	1	0	4
A-ANNO-NPLT	61	NON-PLOT - CONSTRUCTION LINES	6	0	0
A-ANNO-REVS	62	ADDENDA NOTES & BULLETINS	3	1	0
A-IDEN-PRSS	63	SMALL PRESENTATION NUMBERS	0	0	Ft=189

ARCHITECTURAL ELEVATIONS

Name	Level	Description	Color	Weight	Code
A-ANNO-TTLB	1	DRAWING SHEET EDGE & LINES	6	CELLS	CELLS
A-PLAN-KEYP	2	GRAPHIC SCALES & NORTH ARROWS	3,4	CELLS	CELLS
A-ANNO-TEXT	3	TITLE BLOCK TEXT	3,0	CELLS	CELLS
	4				
A-ELEV-OTLN	5	ELEVATION BUILDING OUTLINES	4	2	0
A-ELEV-HIDN	6	ELEVATION HIDDEN LINES	9	1	2
A-ELEV-GRAD	7	ELEVATION GRADE LINE	2	2	0
	8				
S-FNDN	9	CONCRETE FOUNDATIONS	4	2	0
S-GRID	10	COLUMN GRID	4	0	4
	11				
	12				
	13				
	14				
A-WALL-EXTR	15	EXTERIOR WALLS	4	3	0
A-GLAZ	16	WINDOWS	4	CELLS	CELLS
	17				
	18				
	19				
A-FLOR-STRS	20	STAIRS	4	VARIES	0
	21				
	22				
	23				
	24				
A-DOOR	25	DOORS & SWINGS	4,0	3,0	0
A-ELEV-ROOF	26	ROOF MATERIALS (PATTERNS)	0	0	CELLS

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A-ELEV-WALL	27	WALL MATERIALS (PATTERNS)	0	0	CELLS
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				
A-FLOR-EQPM	36	EQUIPMENT	2	CELLS	CELLS
	37				
	38				
	39				
A-ANNO-NOTE	40	SYMBOLS, BUBBLES, TARGETS, ETC.	2,3	CELLS	CELLS
A-ANNO-MATC	41	MATCH, BREAK, & CENTERLINES	3	4/0/0	0/4
	42				
	43				
	44				
	45				
A-ANNO-NOTE	46	NOTES, MISC. TEXT & LEADER LINES	3	1	0
A-DETL-TITL	47	DETAIL TITLES, SCALES, & BUBBLES	3	CELLS	CELLS
A-ANNO-SCHD	48	LEGEND & SCHEDULES (LINES & TEXT)	0,6	CELLS	CELLS
	49				
A-ANNO-DIMS	50	DIMENSIONS & WITNESS LINES	4,0	1,0	Style
	51				
	52				
	53				
	54				
	55				
	56				
	57				
A-ANNO-ENGR	58	REFERENCE NOTES - ENGINEERING			
A-ANNO-KEYN	59	KEYNOTES & SPECIFICATION SECTION NOS.			
	60				
A-ANNO-NPLT	61	NON-PLOT - CONSTRUCTION LINES	6	0	0
A-ANNO-REVS	62	ADDENDA NOTES & BULLETINS	3	1	0
	63				

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DETAILS & SECTIONS

Name	Level	Description	Color	Weight	Code
A-ANNO-TTLB	1	DRAWING SHEET EDGE & LINES	6	CELLS	CELLS
A-PLAN-KEYP	2	GRAPHIC SCALES & NORTH ARROWS	3,4	CELLS	CELLS
A-ANNO-TEXT	3	TITLE BLOCK TEXT	3,0	CELLS	CELLS
D-ANNO-GRID*	4	Modular Detail Ref. Grid - Lines	6	0	0
D-ANNO-TICM*	5	Modular Detail Ref. Grid - TIC Marks	6	1	1
D-DV1*	6	DIVISION 1 - General Requirements	VARIES	VARIES	VARIES
D-DV2-EDGE*	7	DIVISION 2 - Sitework: Earth Edges & Patterns	6	1	1
D-DV2-DETL*	8	DIVISION 2 - Sitework: Detail	0	CELLS	CELLS
D-2&3*	9	Floating Level - Divs. 2 & 3	VARIES	VARIES	VARIES
S-GRID*	10	Column Grid (Centerlines)	2	0	4
S-GRID-IDEN*	11	Column Grid Bubbles	2	CELLS	CELLS
D-DV3-EDGE*	12	DIVISION 3 - Concrete Edges & Patterns	4	1,2	0
D-DV3-DETL*	13	DIVISION 3 - Concrete: Detail	0	CELLS	CELLS
D-DV3-ACES*	14	DIVISION 3 - Concrete: Accessories	2,12	CELLS	CELLS
A-WALL-EXTR*	15	Exterior Wall Edges	4	2	2
D-DV4-EDGE*	16	DIVISION 4 - Masonry: Edges & Patterns	4	1	0
D-DV4-DETL*	17	DIVISION 4 - Masonry: Detail	0	0	0
D-DV4-ACES	18	DIVISION 4 - Masonry: Accessories	2,12	CELLS	CELLS
D-4&5*	19	Floating Level - Divisions 4 & 5	VARIES	VARIES	VARIES
D-DV5-EDGE*	20	DIVISION 5 - Metals: Struct. Steel, Deck, etc	2,12	CELLS	CELLS
D-DV5-DETL*	21	DIVISION 5 - Metals: Details	0	0	0
D-DV6-EDGE*	22	DIVISION 6 - Wood & Plastics: Edges & Patterns	4,7	1	0
D-DV6-DETL*	23	DIVISION 6 - Wood & Plastics: Detail	0	0	0
D-DV6-ARCH*	24	DIVISION 6 - Wood & Plastics: Arch. Woodwork	4,7	0	0
D-6&7*	25	Floating Level - Divs. 6 & 7	VARIES	VARIES	VARIES
D-DV7-EDGE*	26	DIVISION 7 - Thermal & Moist. Prot.: Edges	11,12	1	0
D-DV7-DETL*	27	DIVISION 7 - Thermal & Moist. Prot.: Detail	0	0	0
D-DV7-ALTP*	28	DIVISION 7 - Thermal & Moist. Prot.: Ald. Detail	0	0	0
D-DV8-EDGE*	29	DIVISION 8 - Doors & Windows: Edges & Patts	4,7	1	0
D-DV8-DETL*	30	DIVISION 8 - Doors & Windows: Details	0	0	0
D-8&9*	31	Floating Level - Divs. 8 & 9	VARIES	VARIES	VARIES
D-DV9-EDGE*	32	DIVISION 9 - Finishes: Edges & Patterns	VARIES	VARIES	VARIES
D-DV9-DETL*	33	DIVISION 9 - Finishes: Details	0	0	0
D-DV10-EDGE*	34	DIVISION 10 - Specialties: Edges & Patterns	VARIES	VARIES	VARIES
D-DV10-DETL*	35	DIVISION 10 - Specialties: Details	0	0	0
D-1011*	36	Floating Level - Divs. 10 & 11	VARIES	VARIES	VARIES
D-DV11-EDGE*	37	DIVISION 11 - Equipment: Edges & Patterns	CELLS	CELLS	CELLS
D-DV11-DETL*	38	DIVISION 11 - Equipment: Details	0	0	0
D-DV11-HIDN*	39	DIVISION 11 - Equipment: Hidden Lines	0	0	2
A-ANNO-SYMB	40	SYMBOLS, BUBBLES, TARGETS, ETC.	2,3	CELLS	CELLS
A-ANNO-MATC	41	MATCH, BREAK, & CENTERLINES	3	4/0/0	0/4
A-DOOR-IDEN*	42	Door Numbers and Symbols	3	CELLS	CELLS
A-GLAS-IDEN*	43	Window Type Labels (Lollipops)	3	CELLS	CELLS
D-DV12-EDGE*	44	DIVISION 12 - Furnishings: Edges & Patterns	2	CELLS	CELLS
D-DV12-DETL*	45	DIVISION 12 - Furnishings: Details	0	0	0
A-ANNO-NOTE	46	NOTES, MISC. TEXT & LEADER LINES	3	1	0

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A-DETL-TITL	47	DETAIL TITLES, SCALES, & BUBBLES	3	CELLS	CELLS
A-ANNO-SCHD	48	LEGEND & SCHEDULES (LINES & TEXT)	0,6	CELLS	CELLS
D-SWNG*	49	Door and window swings, etc	VARIES	VARIES	VARIES
A-ANNO-DIMS	50	DIMENSIONS & WITNESS LINES	4,0	1,0	Style
D-DV13*	51	DIVISION 13 - Special Construction : Edges .	VARIES	VARIES	VARIES
D-1314*	52	Floating Level - Divs. 13 & 14	VARIES	VARIES	VARIES
D-DV14*	53	DIVISION 14 - Conveying Devices : Edges	VARIES	VARIES	VARIES
D-DV15-EDGE*	54	DIVISION 15 - Mechanical : Edges & Patterns	2,9,...	1	0
D-DV15-DETL*	55	DIVISION 15 - Mechanical : Details	0	0	0
D-1516*	56	Floating Level - Divs. 15 & 16	VARIES	VARIES	VARIES
D-DV16-EDGE*	57	DIVISION 16 - Electrical : Edges & Patterns	15	1	0
D-DV16-DETL*	58	DIVISION 16 - Electrical : Details	0	0	0
D-ANNO-KEYN	59	Keynotes and Specification Numbers			
A-WALL-CNTR	60	Wall Centerlines	1	0	3
A-ANNO-NPLT	61	NON-PLOT - CONSTRUCTION LINES	6	0	0
A-ANNO-REVS	62	ADDENDA NOTES & BULLETINS	3	1	0
D-PTRN*	63	Alternate Patterns	0	0	0

ARCHITECTURAL REFLECTED CEILINGS PLANS (May be combined with Arch Floor Plans)

Name	Level	Description	Color	Weight	Code
A-ANNO-TTLB	1	DRAWING SHEET EDGE & LINES	6	CELLS	CELLS
A-PLAN-KEYP	2	GRAPHIC SCALES & NORTH ARROWS	3,4	CELLS	CELLS
A-ANNO-TEXT	3	TITLE BLOCK TEXT	3,0	CELLS	CELLS
A-BLDG-OTLN	4	BUILDING OUTLINE (Footprint)	12	2	0
	5				
	6				
	7				
	8				
	9				
A-CLNG-ACCS	70	ACCESS PANELS, CEILING PENETRATIONS	5	2	0
A-CLNG-GRID	71	CEILING GRID	3	1	0
A-CLNG-TEES	72	CEILING MAIN TEES	1	0	0
A-CLNG-CONT	73	CEILING CONTROL JOINTS	4	2	0
A-CLNG-OPEN	74	CEILING / ROOF PENETRATIONS	9	0	0
A-CLNG-PATT	75	CEILING PATTERNS	9	CELLS	CELLS
A-CLNG-SUSP	76	SUSPENDED ELEMENTS (CLOCKS, ETC.)	1	CELLS	CELLS
A-CLNG-EXIT	77	EXIT SIGNS	3	CELLS	CELLS
A-CLNG-SMOK	78	SMOKE DETECTORS	3	CELLS	CELLS
A-CLNG-COMM	79	COMMUNICATION DEVICES (P.A., ETC.)	12	CELLS	CELLS
A-LITE-CLNG	80	CEILING RECESSED LIGHTS **	7	1	CELLS
A-LITE-EMER	81	EMERGENCY LIGHTS **	3	1	CELLS
A-LITE-SURF	82	SURFACE / PENDANT MOUNTED LIGHTS **	7	1	CELLS
A-LITE-WALL	83	WALL MOUNTED LIGHTS **	7	1	CELLS
	24				
	25				

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	26				
	27				
	28				
	29				
A-SPRN-EQPM	30	SPRINKLERS	7	CELLS	CELLS
	34				
A-HVAC-OTHR	90	OTHER OUTLETS & INLETS **	2	CELLS	CELLS
A-HVAC-RDFF	91	CEILING RETURN INLETS **	1	CELLS	CELLS
A-HVAC-SDFF	92	CEILING SUPPLY DIFFUSERS **	7	CELLS	CELLS
	38				
A-FLOR-OVHD	39	CEILING REFS (OVERHEAD - SOFFITS, ETC.)	4	0	2
A-ANNO-SYMB	40	SYMBOLS, BUBBLES, TARGETS, ETC.	2,3	CELLS	CELLS
A-ANNO-MATC	41	MATCH, BREAK, & CENTERLINES	3	4/0/0	0/4
	42				
	43				
A-WALL-FIRE	44	WALL FIRE RATINGS			
A-ANNO-ROOM	45	ROOM NUMBERS	2	1	CELL
A-ANNO-NOTE	46	NOTES, MISC. TEXT & LEADER LINES	3	1	0
A-DETL-TITL	47	DETAIL TITLES, SCALES, & BUBBLES	3	CELLS	CELLS
	48				
	49				
A-ANNO-DIMS	50	DIMENSIONS & WITNESS LINES	4,0	1,0	STYLE
	51				
	52				
	53				
	54				
	55				
	56				
	57				
A-ANNO-ENGR	58	REFERENCE NOTES - ENGINEERING	0	0	FT=1
A-ANNO-KEYN	59	KEYNOTES & SPEC. SECTION NUMBERS	0	1	0
A-WALL-CNTR	60	WALL CENTERLINES (APPLICATION)	1	0	4
A-ANNO-NPLT	61	NON-PLOT - CONSTRUCTION LINES	6	0	0
A-ANNO-REVS	62	ADDENDA NOTES & BULLETINS	3	1	0
	63				

** ONLY USE WHEN ELECTRICAL AND HVAC FIXTURES UNAVAILABLE BY REFERENCE

CIVIL/SITE

Name	Level	Description	Color	Weight	Code
A-ANNO-TTLB	1	DRAWING SHEET EDGE & LINES	6	CELLS	CELLS
A-PLAN-KEYP	2	GRAPHIC SCALES & NORTH ARROWS	3,4	CELLS	CELLS
A-ANNO-TEXT	3	TITLE BLOCK TEXT	3,0	CELLS	CELLS
A-BLDG-OTLN	4	BUILDING OUTLINES (Footprints)	12	2	0
C-BLDG-IDEN	5	BUILDING IDENTIFICATION	12	2	0
C-USER-6	6	<i>User definable.</i>			
C-SITE-FENC	7	FENCES & Annotation	4	2	VARIES
C-SITE-IDEN	8	SITE IMPROVEMENTS ANNOTATION	0	1	0
C-SITE-IMPR	9	SITE IMPROVEMENTS	7	0,1	0
C-SITE-SIGN	10	SIGNS & Annotation	7	0,1	0
C-SITE-WALK	11	WALKS & TRAILS & Adjoining low curbs	9	2	VARIES
C-SITE-CBAS	11	Catch Basins	11	1	0
C-SITE-WJNT	11	Control Joints/Expansion Joints	0,0	0,1	3,0
L-SITE-POOL	12	Pools & Fountains & Annotations	7	1	0
C-SITE-BRDG	13	BRIDGES	1	1	0
C-SITE-STEP	14	STEPS	0	1	0
C-PROP-SURV	15	SURVEY INFORMATION - PROP. LINES	4	2	2
C-PROP-BRNG	16	BEARINGS & DISTANCES	0	2	0
C-PROP-CONS	17	CONSTRUCTION LINES w/ annotation	0	2	0
C-PROP-ESMT	18	EASEMENTS w/ annotation	7	2	0
C-PROP-RWAY	19	RIGHT OF WAY w/ annotation	7	2	0
C-TOPO-BORE	20	SOIL BORING LAYOUT			
C-TOPO-MAID	21	MAJOR CONTOURS - ANNOTATION	3	2	0
C-TOPO-MAJR	22	MAJOR CONTOURS	3	3	0
C-TOPO-MIID	23	MINOR CONTOURS - ANNOTATION	0	2	0
C-TOPO-MINR	24	MINOR CONTOURS	0	2	0
C-TOPO-RWAL	25	RETAINING WALLS	4	2	0
C-TOPO-SLID	26	CUT-FILL SLOPES - ANNOTATION	0	0	0
C-TOPO-SLOP	27	CUT-FILL SLOPES	0	2	0
C-TOPO-SPOT	28	SPOT ELEVATIONS & Benchmarks	7	2	0
C-TOPO-XSPT	29	PROFILES & CROSS-SECTIONS	4	2	0
C-ROAD	30	ALL ROADS & Gutters	5	2,0	0
C-ROAD-IDEN	31	ROAD ANNOTATION	5	2	0
C-PKNG	32	ALL PARKING LOTS	0	2	0
C-PNKG-STRP	33	PARKING STRIPING, BUMPERS, ETC.	0,4	1	0
L-PLNT-BEDS	34	Planting Beds	0	1	0
L-PLNT-GRND	35	Ground Cover	11	CELLS	CELLS
L-PLNT-PLNT	36	Planting Plants & Flowers	5	CELLS	CELLS
L-PLNT-SHLN	37	Shrub Line	12	CELLS	2
L-PLNTSHRB	38	Shrubs	12	CELLS	CELLS
L-PLNT-IDEN	39	Planting Identification	VARIES	1	0
A-ANNO-SYMB	40	SYMBOLS, BUBBLES, TARGETS, ETC.	2,3	CELLS	CELLS
A-ANNO-MATC	41	MATCH, BREAK, & CENTERLINES	3	4/0/0	0/4
L-PLNT-TRLN	42	Tree Line	2	0	2
L-PLNT-TREE	43	Trees	2	CELLS	CELLS

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L-PLNT-TRID	44	Tree Identification	2	1	0
L-PLNT-TRSZ	45	Tree Size	2	1	0
A-ANNO-NOTE	46	NOTES, MISC. TEXT & LEADER LINES	3	1	0
A-DETL-TITL	47	DETAIL TITLES, SCALES, & BUBBLES	3	CELLS	CELLS
A-ANNO-SCHD	48	LEGEND & SCHEDULES (LINES & TEXT)	0,6	CELLS	CELLS
L-PLNT-MEML	49	Memorial Trees Annotation	VARIES	1	0
A-ANNO-DIMS	50	DIMENSIONS & WITNESS LINES	4,0	1,0	Style
C-USER-51	51	User definable. (Landscape uses for plant pres.)			
C-USER-52	52	User definable. (Landscape uses for water)			
C-USER-53	53	User definable. (Landscape uses for water anno.)			
C-USER-54	54	User definable.			
C-USER-55	55	User definable.			
C-USER-56	56	User definable.			
C-SITE-DRAIN	57	DRAINAGE ARROWS	0	1	0
A-ANNO-ENGR	58	REFERENCE NOTES - ENGINEERING	0	0	FT=1
C-SITE-TUNL	59	UNDERGROUND TUNNELS	9	1	2
C-USER-60	60	User definable.			
A-ANNO-NPLT	61	NON-PLOT - CONSTRUCTION LINES	6	0	0
A-ANNO-REVS	62	ADDENDA NOTES & BULLETINS	3	1	0
A-USER-63	63	User definable.			

ELECTRICAL - POWER & LIGHTING

Name	Level	Description	Color	Weight	Code
A-ANNO-TTLB	1	DRAWING SHEET EDGE & LINES	6	CELLS	CELLS
A-PLAN-KEYP	2	GRAPHIC SCALES & NORTH ARROWS	3,4	CELLS	CELLS
A-ANNO-TEXT	3	TITLE BLOCK TEXT	3,0	CELLS	CELLS
E-LITE-	4	1/8" LIGHTING FIXTURES	7	CELLS	CELLS
E-LITE-SPCL	5	1/8" SPECIAL FIXTURES	7	CELLS	CELLS
E-LITE-EMER	6	1/8" EMERGENCY LIGHTING FIXTURES	18,7	CELLS	CELLS
E-LITE-EXIT	7	1/8" EXIT FIXTURES	7	CELLS	CELLS
E-LITE-JBSW	8	1/8" HOMERUNS, JBOXES & SWITCHES	7	CELLS	CELLS
E-LITE-IDEN	9	1/8" IDENTIFICATION	7	CELLS	CELLS
E-USER-10	10	User definable.			
E-EMER-LJBS	11	1/8" EMERGENCY HOMERUNS, JBOXES, ETC.	18,7	1,CELLS	0,CELLS
E-EMER-CIRC	12	EMERGENCY WIRING & CONDUITS	18	1	0
E-LITE-CIRC	13	WIRING & CONDUITS	7	1	0
E-LITE-4LIT	14	1/4" LIGHTING FIXTURE	7	CELLS	CELLS
E-LITE-4SPC	15	1/4" SPECIAL LIGHTING FIXTURES	7	CELLS	CELLS
E-LITE-4EMR	16	1/4" EMERGENCY LIGHTING FIXTURES	18,7	CELLS	CELLS
E-LITE-4EXT	17	1/4" EXIT FIXTURES	7	CELLS	CELLS
E-LITE-4JBS	18	1/4" HOMERUNS, JBOXES & SWITCHES	7	CELLS	CELLS
E-LITE-4IDN	19	1/4" IDENTIFICATION	7	1	0
E-USER-20	20	User definable.			
E-EMER-4LJB	21	1/4" EMERG. HOMERUNS, JBOXES, ETC.	18,7	CELLS	CELLS
E-PANL-4IDN	22	1/4" PANEL IDENTIFICATION	89,5,18	1	0
E-PANL-LOWV	23	PANELS - LOW VOLTAGE, ETC.	89	CELLS	CELLS
E-PANL-HIGH	24	PANELS - HIGH VOLTAGE, ETC.	5	CELLS	CELLS

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E-PANL-EMER	25	PANELS - EMERGENCY	18	CELLS	CELLS
E-PANL-IDEN	26	1/8" PANEL IDENTIFICATION	89,5,18	1	0
E-POWR-RCPT	27	1/8" POWER RECEPTACLES	23	CELLS	CELLS
E-EMER-RCPT	28	1/8" EMERGENCY POWER RECEPTACLES	18,23	CELLS	CELLS
E-POWR-MOTR	29	1/8" MOTORS & UTILIZATION EQUIP.	23	CELLS	CELLS
E-POWR-JBSW	30	1/8" HOMERUNS, JBOXES & SWITCHES	23	CELLS	CELLS
E-POWR-IDEN	31	1/8" POWER IDENTIFICATION	23	1	0
E-USER-32	32				
E-EMER-JBSW	33	1/8" EMERG. HOMERUNS, JBOXES, ETC.	18,23	1,CELLS	0,CELLS
E-POWR-CABL	34	POWER CABLE TRAYS, RACEWAYS, ETC.	23	1	0,2
E-POWR-CTPP	35	POWER WIRING & CONDUITS	23	1	2,0
E-EMER-CTPP	36	EMERGENCY WIRING & CONDUITS	18	1	0
E-POWR-4RCP	37	1/4" POWER RECEPTACLES	23	CELLS	CELLS
E-EMER-4RCP	38	1/4" EMERGENCY RECEPTACLES	18,23	CELLS	CELLS
E-POWR-4MTR	39	1/4" MOTORS & ALL UTILIZATION EQUIP.	23	CELLS	CELLS
A-ANNO-SYMB	40	SYMBOLS, BUBBLES, TARGETS, ETC.	2,3	CELLS	CELLS
A-ANNO-MATC	41	MATCH, BREAK, & CENTERLINES	3	4/0/0	0/4
E-POWR-4JBS	42	1/4" POWER HOMERUNS, JBOXES, ETC.	23	CELLS	CELLS
E-POWR-4IDN	43	1/4" POWER IDENTIFICATION	23	1	0
E-USER-44	44	<i>User definable.</i>			
E-EMER-4JBS	45	1/4" EMERG. HOMERUNS, JBOXES, ETC.	18,23	CELLS	CELLS
A-ANNO-NOTE	46	NOTES, MISC. TEXT & LEADER LINES	3	1	0
A-DETL-TITL	47	DETAIL TITLES, SCALES, & BUBBLES	3	CELLS	CELLS
A-ANNO-SCHD	48	LEGEND & SCHEDULES (LINES & TEXT)	0,6	CELLS	CELLS
E-USER-49	49	<i>User definable.</i>			
A-ANNO-DIMS	50	DIMENSIONS & WITNESS LINES	4,0	1,0	Style
E-GRND-51	51	GROUNDING SYSTEMS			
E-GRND-52	52	GROUNDING SYSTEMS			
E-GRND-53	53	GROUNDING SYSTEMS			
I-FURN	54	AOC FURNISHINGS - EDGES			
I-FURN-IDEN	55	AOC FURNISHINGS - IDENTIFICATION			
I-FURN-CLER	56	AOC FURNISHINGS - CLEARANCES			
E-RISR-GRAP	57	RISER DIAGRAMS - GRAPHICS	5,89,18		
E-RISR-TEXT	58	RISER DIAGRAMS - TEXT	5,89,18		
E-REFS-SPEC	59	REFERENCES - SPEC SECTIONS			
E-REFS-CLNG	60	REFERENCES - CEILING LINES			
A-ANNO-NPLT	61	NON-PLOT - CONSTRUCTION LINES	6	0	0
E-3D	62	3D GRAPHICS	3	1	0
E-BLDG-OTLN	63	BUILDING FOOTPRINT			

FIRE PROTECTION

Name	Level	Description	Color	Weight	Code
A-ANNO-TTLB	1	DRAWING SHEET EDGE & LINES	6	CELLS	CELLS
A-LAN-KEYP	2	GRAPHIC SCALES & NORTH ARROWS	3,4	CELLS	CELLS
A-ANNO-TEXT	3	TITLE BLOCK TEXT	3,0	CELLS	CELLS
A-BLDG-OTLN	4	BUILDING FOOTPRINT			
F-AFFF-CIRC	5	1/8" - FOAM SYSTEM - CIRCUITS	138	1	4,CELLS
F-AFFF-ALRM	6	1/8" - FOAM SYSTEM - ALARMS, DETECTORS	138	CELLS	0,CELLS
F-AFFF-CABS	7	1/8" - FOAM SYSTEM - CABINETS, ETC.	138	CELLS	CELLS
F-AFFF-PIPE	8	1/8" - FOAM SYSTEM - PIPES, DEVICES, ETC.	138	1,3	4,CELLS
F-AFFF-EQPM	9	1/8" - FOAM STANDALONE - EXTINGUISHERS	138	CELLS	CELLS
F-AFFF-NOTE	10	1/8" - FOAM SYSTEM - NOTES	138	0	0
F-AFFF-ZONE	11	1/8" - FOAM SYSTEM - ZONES	138	0	0
F-USER-12	12	User definable.			
F-USER-13	13	User definable.			
F-USER-14	14	User definable.			
F-CO2S-CIRC	15	1/8" - CO2S SYSTEM - CIRCUITS	2	1	4,CELLS
F-CO2S-ALRM	16	1/8" - CO2S SYSTEM - ALARMS, DETECTORS	2	CELLS	0,CELLS
F-CO2S-CABS	17	1/8" - CO2S SYSTEM - CABINETS	2	CELLS	CELLS
F-CO2S-PIPE	18	1/8" - CO2S SYSTEM - PIPING	2	1,3	4,CELLS
F-CO2S-EQPM	19	1/8" - CO2S STANDALONE - EXTINGUISHER	2	CELLS	CELLS
F-CO2S-NOTE	20	1/8" - CO2S SYSTEM - NOTES	2	0	0
F-CO2S-ZONE	21	1/8" - CO2S SYSTEM - ZONES	2	0	0
F-USER-22	22	User definable.			
F-USER-23	23	User definable.			
F-USER-24	24	User definable.			
F-SPRN-CIRC	25	1/8" - SPRINKLER SYSTEM - CIRCUITS	7	1	0,CELLS
F-SPRN-ALRM	26	1/8" - SPRINKLER SYSTEM - ALARMS, DETECT	7	CELLS	0,CELLS
F-SPRN-CABS	27	1/8" - SPRINKLER SYSTEM - CABINETS	7	CELLS	CELLS
F-SPRN-PIPE	28	1/8" - SPRINKLER SYSTEM - PIPES, DEVICES	7	1,3	0,CELLS
F-SPRN-EQPM	29	1/8" - SPRINKLER STANDALONE - EXTING'S	7	CELLS	CELLS
F-SPRN-STAN	30	1/8" - SPRINKLER SYSTEM - STANDPIPES	7	1	0,CELLS
F-SPRN-NOTE	31	1/8" - SPRINKLER SYSTEM - NOTES	7	1	0
F-SPRN-ZONE	32	1/8" - SPRINKLER SYSTEM - ZONES	7	1	0
F-SPRN-EXNG	33	1/8" - SPRINKLER - EXISTING PIPING	7	1	0
F-HALN-NOTE	34	1/8" - HALON SYSTEM - NOTES & ZONES	16	1	0
F-HALN-EQPM	35	1/8" - HALON SYSTEM - CIRCUITS, HOMERUN	16	1	6,CELLS
F-HALN-ALRM	36	1/8" - HALON SYSTEM - ALARMS, DETECTORS	16	CELLS	0,CELLS
F-HALN-CABS	37	1/8" - HALON SYSTEM - CABINETS	16	CELLS	CELLS
F-HALN-PIPE	38	1/8" - HALON SYSTEM - PIPING, DEVICES	16	1,3	6,CELLS
F-HALN-STAN	39	1/8" - HALON - STANDALONE - EXTING'S.	16	CELLS	CELLS
A-ANNO-SYMB	40	SYMBOLS, BUBBLES, TARGETS, ETC.	2,3	CELLS	CELLS
A-ANNO-MATC	41	MATCH, BREAK, & CENTERLINES	3	4/0/0	0/4
F-PROT-SMOK	42	SMOKE DETECTORS, HEAT SENSORS	10	CELLS	CELLS
F-USER-43	43	User definable.			
F-GNRL-COST	44	COST ESTIMATE NOTES	-	-	-
F-PROT-EQPM	45	GENERAL EQUIPMENT	-	-	-
A-ANNO-NOTE	46	NOTES, MISC. TEXT & LEADER LINES	3	1	0

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A-DETL-TITL	47	DETAIL TITLES, SCALES, & BUBBLES	3	CELLS	CELLS
A-ANNO-SCHD	48	LEGEND & SCHEDULES (LINES & TEXT)	0,6	CELLS	CELLS
F-USER-49	49	<i>User definable.</i>			
A-ANNO-DIMS	50	DIMENSIONS & WITNESS LINES	4,0	1,0	Style
F-USER-51	51	<i>User Definable.</i>	-	-	-
F-USER-52	52	<i>User Definable.</i>	-	-	-
F-USER-53	53	<i>User Definable.</i>	-	-	-
F-USER-54	54	<i>User Definable.</i>	-	-	-
F-USER-55	55	<i>User Definable.</i>	-	-	-
F-USER-56	56	<i>User Definable.</i>	-	-	-
F-REFS-STRC	57	REFERENCE NOTES (Structural)	-	-	-
A-REFS-ENGR	58	REFERENCE NOTES (Mech/Electrical)	-	-	-
F-USER-59	59	<i>User Definable.</i>			
F-USER-60	60	<i>User Definable.</i>			
A-ANNO-NPLT	61	NON-PLOT - CONSTRUCTION LINES	6	0	0
A-ANNO-REVS	62	ADDENDA NOTES & BULLETINS	3	1	0
F-USER-63	63	<i>User Definable.</i>			

HVAC PLANS

Name	Level	Description	Color	Weight	Code
A-ANNO-TTLB	1	DRAWING SHEET EDGE & LINES	6	CELLS	CELLS
A-PLAN-KEYP	2	GRAPHIC SCALES & NORTH ARROWS	3,4	CELLS	CELLS
A-ANNO-TEXT	3	TITLE BLOCK TEXT	3,0	CELLS	CELLS
A-BLDG-OTLN	4	BUILDING OUTLINE	5	2	0
M-HVAC-5	5	<i>User definable.</i>			
M-HVAC-EQPM	6	MECHANICAL EQUIPMENT	162	CELLS	CELLS
M-HVAC-DOOR	7	EQUIPMENT ACCESS DOORS			
M-HVAC-HOOD	8	HOODS - ALL			
M-HVAC-9	9	<i>User definable.</i>			
M-HVAC-10	10	<i>User definable.</i>	5	2	0
M-HVAC-SDFF	11	GRILLES, DIFFUSERS, REG. - SUPPLY (EXIST)	18	1	2
M-HVAC-SDFN	110	GRILLES, DIFFUSERS, REG. - SUPPLY (NEW)	18	2	0
M-HVAC-SDFD	111	GRILLES, DIFFUSERS, REG. - SUPPLY (DEMO)	18	2	2
M-HVAC-RDFF	12	GRILLES - RETURN (EXIST)	46	1	2
M-HVAC-RDFN	120	GRILLES - RETURN (NEW)	46	2	0
M-HVAC-RDFD	121	GRILLES - RETURN (DEMO)	46	2	2
M-EXHS-CDFF	13	GRILLES - EXHAUST (EXIST)	46	1	2
M-EXHS-CDFN	130	GRILLES - EXHAUST (NEW)	46	2	0
M-EXHS-CDFD	131	GRILLES - EXHAUST (DEMO)	46	2	2
M-HVAC-MDFF	14	GRILLES - MAKEUP (EXIST)	46	1	2
M-HVAC-MDFN	140	GRILLES - MAKEUP (NEW)	46	2	0
M-HVAC-MDFD	141	GRILLES - MAKEUP (DEMO)	46	2	2
M-HVAC-ODFF	15	GRILLES, DIFFUSER, REG. - OTHER (EXIST)	46	1	2
M-HVAC-ODFN	150	GRILLES, DIFFUSER, REG. - OTHER (NEW)	46	2	0
M-HVAC-ODFD	151	GRILLES, DIFFUSER, REG. - OTHER (DEMO)	46	2	2
M-HVAC-SLBL	16	DUCT LABELS - SUPPLY	14	1	FT=1

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M-HVAC-RLBL	17	DUCT LABELS - RETURN	14	1	FT=1
M-HVAC-ELBL	18	DUCT LABELS - EXHAUST	14	1	FT=1
M-HVAC-MLBL	19	DUCT LABELS - MAKEUP	14	1	FT=1
M-HVAC-OLBL	20	DUCT LABELS - OTHER	14	1	FT=1
M-HVAC-21	21	User Definable.	-	-	-
M-HVAC-22	22	User Definable.	-	-	-
M-HVAC-23	23	User Definable.	-	-	-
M-DUAL-EQPM	24	DUAL TEMPERATURE PIPING EQUIP.	0	0	0
M-DUAL-PIPE	25	DUAL TEMPERATURE PIPING	0	0	0
M-HVAC-SDCL	26	DUCT CENTERLINES - SUPPLY	1	0	4
M-HVAC-RDCL	27	DUCT CENTERLINES - RETURN	1	0	4
M-HVAC-EDCL	28	DUCT CENTERLINES - EXHAUST	1	0	4
M-HVAC-MDCL	29	DUCT CENTERLINES - MAKEUP	1	0	4
M-HVAC-ODCL	30	DUCT CENTERLINES - OTHER	1	0	4
M-HVAC-SUPP	31	DUCT FITTINGS/EDGES - SUPPLY (EXIST)	20	1	2
M-HVAC-SUPN	310	DUCT FITTINGS/EDGES - SUPPLY (NEW)	20	2	0
M-HVAC-SUPD	311	DUCT FITTINGS/EDGES - SUPPLY (DEMO)	20	2	2
M-HVAC-RETN	32	DUCT FITTINGS/EDGES - RETURN (EXIST)	12	1	2
M-HVAC-RTNN	320	DUCT FITTINGS/EDGES - RETURN (NEW)	12	2	0
M-HVAC-RETD	321	DUCT FITTINGS/EDGES - RETURN (DEMO)	12	2	2
M-EXHS-DUCT	33	DUCT FITTINGS/EDGES - EXHAUST (EXIST)	12	1	2
M-EXHS-DUCN	330	DUCT FITTINGS/EDGES - EXHAUST (NEW)	12	2	0
M-EXHS-DUCD	331	DUCT FITTINGS/EDGES - EXHAUST (DEMO)	12	2	2
M-HVAC-MKUP	34	DUCT FITTINGS/EDGES - MAKEUP (EXIST)	12	1	2
M-HVAC-MKUN	340	DUCT FITTINGS/EDGES - MAKEUP (NEW)	12	2	0
M-HVAC-MKUD	341	DUCT FITTINGS/EDGES - MAKEUP (DEMO)	12	2	2
M-HVAC-OTHR	35	DUCT FITTINGS/EDGES - OTHER (EXIST)	12	1	2
M-HVAC-OTHN	350	DUCT FITTINGS/EDGES - OTHER (NEW)	12	2	0
M-HVAC-OTHD	351	DUCT FITTINGS/EDGES - OTHER (DEMO)	12	2	2
M-HVAC-LING	36	DUCT LINING	5	1	0
M-HVAC-INSL	37	DUCT INSULATION	6	1	0
A-PLAN-NOTE	38	Architectural Reference Notes			
E-PLAN-NOTE	39	Electrical Reference Notes	4	0	2
A-ANNO-SYMB	40	SYMBOLS, BUBBLES, TARGETS, ETC.	2,3	CELLS	CELLS
A-ANNO-MATC	41	MATCH, BREAK, & CENTERLINES	3	4/0/0	0/4
M-HVAC-DEVC	42	DEVICE SYMBOLOGY			
M-ANNO-KEYN	43	KEYNOTES & SPECIFICATIONS SECTIONS.			
M-FUEL-OGEP	44	FUEL SYSTEM PIPING & VALVES			
M-CONT-INST	45	CONTROLS & INSTRUMENTATION	10	CELLS	CELLS
A-ANNO-NOTE	46	NOTES, MISC. TEXT & LEADER LINES	3	1	0
A-DETL-TITL	47	DETAIL TITLES, SCALES, & BUBBLES	3	CELLS	CELLS
A-ANNO-SCHD	48	LEGEND & SCHEDULE GRAPHICS & NOTES			
M-HVAC-49	49	User definable.			
A-ANNO-DIMS	50	DIMENSIONS & WITNESS LINES	4,0	1,0	STYLE
M-CWTR-PIPE	51	CHILLED WATER PIPING - SUPPLY (EXIST)	148	3	-CHWS-
M-CWTR-PIPN	510	CHILLED WATER PIPING - SUPPLY (NEW)	148	4	-CHWS-
M-CWTR-PISD	511	CHILLED WATER PIPING - SUPPLY (DEMO)	148		-CHWS-
M-CWTR-PIRE	512	CHILLED WATER PIPING - RETURN (EXIST)	148	3	-CHWR-

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M-CWTR-PIRN	513	CHILLED WATER PIPING - RETURN (NEW)	148	4	-CHWR-
M-CWTR-PIRD	514	CHILLED WATER PIPING - RETURN (DEMO)	148		-CHWR-
M-CWTR-EQPM	52	CHILLED WATER EQUIPMENT	148	CELLS	CELLS
M-CWTR-IDEN	53	CHILLED WATER IDENTIFICATION	64	1	FT=1
M-HWTR-PIPE	54	HEATING WATER PIPING - SUPPLY (EXIST)	136	3	-HWS-
M-HWTR-PIPN	540	HEATING WATER PIPING - SUPPLY (NEW)	136	4	-HWS-
M-HWTR-PIPD	541	HEATING WATER PIPING - SUPPLY (DEMO)			-HWS-
M-HWTR-PIRE	542	HEATING WATER PIPING - RETURN (EXIST)	136	3	-HWR-
M-HWTR-PIRN	543	HEATING WATER PIPING - RETURN (NEW)	136	4	-HWR-
M-HWTR-PIRD	544	HEATING WATER PIPING - RETURN (DEMO)			-HWR-
M-HWTR-EQPM	55	HEATING WATER EQUIPMENT	136	CELLS	CELLS
M-HWTR-IDEN	56	HEATING WATER IDENTIFICATION	64	1	FT=1
M-STEM-CONP	57	STEAM CONDENSATE PIPING	154	3	-LPR-
M-STEM-LPIP	58	LOW PRESSURE STEAM PIPING	48	3	-LPS-
M-STEM-HPIP	59	HIGH PRESSURE STEAM PIPING	40	2	HPR,HPS
M-STEM-EQPM	60	STEAM EQUIPMENT	48	CELLS	CELLS
A-ANNO-NPLT	61	NON-PLOT - CONSTRUCTION LINES	6	0	0
A-ANNO-REVS	62	ADDENDA NOTES & BULLETINS	3	1	0
M-STEM-IDEN	63	STEAM IDENTIFICATION	64	1	FT=1

LANDSCAPE

Name	Level	Description	Color	Weight	Code
A-ANNO-TTLB	1	DRAWING SHEET EDGE & LINES	6	CELLS	CELLS
A-LAN-KEYP	2	GRAPHIC SCALES & NORTH ARROWS	3,4	CELLS	CELLS
A-ANNO-TEXT	3	TITLE BLOCK TEXT	3,0	CELLS	CELLS
A-BLDG-OTLN	4	BUILDING OUTLINES	12	2	0
C-BLDG-IDEN	5	BUILDING IDENTIFICATION	12	2	0
L-USER-6	6	User definable.			
C-SITE-FENC	7	Fences	4	2	Varies
C-SITE-IDEN	8	Site Improvements Annotation	0	1	0
C-SITE-IMPR	9	Site Improvements	7	0,1	0
C-SITE-SIGN	10	Signs	7	0,1	0
C-SITE-WALK	11	Walks & Trails	9	2	Varies
L-SITE-POOL	12	POOLS & FOUNTAINS	7	1	0
C-SITE-BRDG	13	Bridges	1	1	0
L-SITE-STEP	14	STEPS	0	1	0
C-PROP-SURV	15	Survey Information - Prop. Lines	4	2	2
C-PROP-BRNG	16	Bearings & Distances	0	2	0
C-PROP-CONS	17	Construction Lines W/ Anno.	0	2	0
C-PROP-ESMT	18	Easements W/ Anno.	7	2	0
C-PROP-RWAY	19	Right of Way W/ Anno	7	2	0
C-TOPO-BORE	20	Soil Boring Layout			
C-TOPO-MAID	21	Major Contours - Annotation	3	2	0
C-TOPO-MAJR	22	Major Contours	3	3	0
C-TOPO-MIID	23	Minor Contours - Annotation	0	2	0
C-TOPO-MINR	24	Minor Contours	0	2	0

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C-TOPO-RWAL	25	Retaining Walls	4	2	0
C-TOPO-SLID	26	Cut-fill Slopes - Annotation	0	0	0
C-TOPO-SLOP	27	Cut-fill Slopes	0	2	0
C-TOPO-SPOT	28	Spot Elevations	7	2	0
C-TOPO-XSPT	29	Profiles & Cross-sections	4	2	0
C-ROAD	30	All Roads	5	2	0
C-ROAD-IDEN	31	Road Annotation	5	2	0
C-PKNG	32	All Parking Lots	0	2	0
C-PKNG-STRP	33	Parking Striping, Bumpers, Etc.	0,4	1	0
L-PLNT-BEDS	34	PLANTING BEDS	0	1	0
L-PLNT-GRND	35	GROUND COVER	11	CELLS	CELLS
L-PLNT-PLNT	36	PLANTING PLANTS & FLOWERS	5	CELLS	CELLS
L-PLNT-SHLN	37	SHRUB LINE	12	CELLS	2
L-PLNTSHRB	38	SHRUBS	12	CELLS	CELLS
L-PLNT-IDEN	39	PLANTING IDENTIFICATION	VARIES	1	0
A-ANNO-SYMB	40	SYMBOLS, BUBBLES, TARGETS, ETC.	2,3	CELLS	CELLS
A-ANNO-MATC	41	MATCH, BREAK, & CENTERLINES	3	4/0/0	0/4
L-PLNT-TRLN	42	TREE LINE	2	0	2
L-PLNT-TREE	43	TREES	2	CELLS	CELLS
L-PLNT-TRID	44	TREE IDENTIFICATION	2	1	0
L-PLNT-TRSZ	45	TREE SIZE	2	1	0
A-ANNO-NOTE	46	NOTES, MISC. TEXT & LEADER LINES	3	1	0
A-DETL-TITL	47	DETAIL TITLES, SCALES, & BUBBLES	3	CELLS	CELLS
A-ANNO-SCHD	48	LEGEND & SCHEDULES (LINES & TEXT)	0,6	CELLS	CELLS
L-PLNT-MEML	49	MEMORIAL TREES ANNOTATION	VARIES	1	0
A-ANNO-DIMS	50	DIMENSIONS & WITNESS LINES	4,0	1,0	Style
L-PLNT-PRES	51	Plants (Presentations)	VARIES	CELLS	CELLS
L-SITE-WATR	52	WATER FEATURES (Streams, rivers, etc.)	7	0	1
L-SITE-WANN	53	WATER FEATURES - ANNOTATION	7	1	0
L-USER-54	54	User definable.			
L-USER-55	55	User definable.			
L-USER-56	56	User definable.			
C-SITE-DRAIN	57	Drainage Arrows	0	1	0
E-ANNO-ENGR	58	REFERENCE NOTES - ENGINEERING	0	0	0
C-SITE-TUNL	59	UNDERGROUND TUNNELS	9	1	2
L-USER-60	60	User definable.			
A-ANNO-NPLT	61	NON-PLOT - CONSTRUCTION LINES	6	0	0
A-ANNO-REVS	62	ADDENDA NOTES & BULLETINS	3	1	0
L-USER-63	63				

PLUMBING FLOOR PLANS

Name	Level	Description	Color	Weight	Code
A-ANNO-TTLB	1	DRAWING SHEET EDGE & LINES	6	CELLS	CELLS
A-PLAN-KEYP	2	GRAPHIC SCALES & NORTH ARROWS	3,4	CELLS	CELLS
A-ANNO-TEXT	3	TITLE BLOCK TEXT	3,0	CELLS	CELLS
A-BLDG-OTLN	4	BUILDING FOOTPRINT	12	2	0
	5				
	6				
	7				
	8				
	9				
P-ACID-PIPE	10	ACID, ALKALINE, OIL WASTE	4	2	ACID
P-GAS-PIPE	11	GAS PIPING	4	2	G
	12				
	13				
	14				
P-DOMW-HPIP	15	DOMESTIC PIPING - HOT	3	2	HWR
P-DOMW-CPIP	16	DOMESTIC PIPING - COLD	2	2	4
P-DOMW-RPIP	17	DOMESTIC PIPING - RECIRCULATION	3,2	1	0
P-DMOW-EQPM	18	DOMESTIC WATER EQUIPMENT			
P-DOMW-IDEN	19	DOMESTIC IDENTIFICATION			
P-DRKG-PIPE	20	DRINKING WATER	2	2	DWS,DWR
P-DRKG-IDEN	21	DRINKING WATER IDENTIFICATION	2	1	0
	22				
	23				
	24				
P-SANR-PIPE	25	SANITARY DRAINAGE PIPING	10	2	SAN
P-SANR-VENT	26	SANITARY VENTS	10	2	3
P-SANR-EQPM	27	SANITARY EQUIPMENT	10	2	CD
P-SANR-FLDR	28	SANITARY FLOOR DRAINS & C.O.	10	1	0
P-SANR-IDEN	29	SANITARY DRAINAGE IDENTIFICATION			
P-SANR-FIXT	30	PLUMBING FIXTURES	2	CELLS	CELLS
P-FIXT-IDEN	31	PLUMBING FIXTURES IDENTIFICATION	2	1	0
	32				
	33				
	34				
P-STRM-PIPE	35	STORM DRAINAGE	4	2	ST
P-STRM-RFDR	36	ROOF DRAINS	4	1	0
P-STRM-IDEN	37	STORM DRAINAGE IDENTIFICATION			
P-EQPM	38	MISC. PLUMBING EQUIPMENT			
P-	39				
A-ANNO-SYMB	40	SYMBOLS, BUBBLES, TARGETS, ETC.	2,3	CELLS	CELLS
A-ANNO-MATC	41	MATCH, BREAK, & CENTERLINES	3	4/0/0	0/4
	42				
	43				
	44				
	45				
A-ANNO-NOTE	46	NOTES, MISC. TEXT & LEADER LINES	3	1	0

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A-DETL-TITL	47	DETAIL TITLES, SCALES, & BUBBLES	3	CELLS	CELLS
A-ANNO-SCHD	48	LEGEND & SCHEDULES (LINES & TEXT)	0,6	CELLS	CELLS
	49				
A-ANNO-DIMS	50	DIMENSIONS & WITNESS LINES	4,0	1,0	STYLE
	51				
	52				
	53				
	54				
	55				
	56				
S-REFS-STRC	57	REFERENCE NOTES - STRUCTURAL			
A-ANNO-ENGR	58	REFERENCE NOTES - ENGINEERING	0	0	FT=1
P-ANNO-KEYN	59	KEYNOTES & SPEC. SECTION NUMBERS	0	1	0
A-WALL-CNTR	60	WALL CENTERLINES (APPLICATION)	1	0	4
A-ANNO-NPLT	61	NON-PLOT - CONSTRUCTION LINES	6	0	0
A-ANNO-REVS	62	ADDENDA NOTES & BULLETINS	3	1	0
P-ANNO-PATT	63	PLUMBING PATTERNS			

STRUCTURAL PLANS

Name	Level	Description	Color	Weight	Code
A-ANNO-TTLB	1	DRAWING SHEET EDGE & LINES	6	CELLS	CELLS
A-PLAN-KEYP	2	GRAPHIC SCALES & NORTH ARROWS	3,4	CELLS	CELLS
A-ANNO-TEXT	3	TITLE BLOCK TEXT	3,0	CELLS	CELLS
A-BLDG-OTLN	4	BUILDING OUTLINE (footprint)	6	1	0
S-FNDN-FTNG	5	FOOTINGS	4	1	3
A-FLOR-OTLN	6	EXTERIOR PERIMETER SHAPE	6	1	0
S-FNDN-CPGB	7	COLUMN PEDESTALS, GRADE BEAMS	4	1	0
S-FNDN-RBAR	8	FOUNDATION REINFORCING	2	2	4
S-FNDN-PILE	9	PILES - SHEET, STEEL, CONCRETE, ETC.	4	1	0
S-GRID*	10	COLUMN GRID (CENTERLINES)	2	0	4
S-GRID-IDEN	11	COLUMN GRID TAGS	2	1	0
S-COLS	12	COLUMNS (CONCRETE & STEEL)	2	CELLS	CELLS
S-COLS-DIMS	13	COLUMN CENTERLINE DIMENSIONS	0	0	0
S-COLS-IDEN	14	COLUMN TAGS	0	1	0
S-WALL	15	EXTERIOR WALLS & PARTITIONS	140	0	0
S-USER-16	16	User Definable.			
S-JNTS-CTRL	17	JOINTS - CONTROL & EXPANSION	7	1	0
S-FRAM-SHFT	18	SHAFTS & DECK OPENINGS	3	0	0
S-GRAT	19	GRATING, CATWALKS, ETC.	9	0	0
S-STRS-FRAM	20	STAIRS FRAMING	2	1	0
S-STRS-RBAR	21	STAIR REINFORCING	2	1	0
S-STRS-LADD	22	LADDERS, LADDER HANDRAILS, GUARDRAILS	2	1	0
S-WALL-NONL	23	WALLS - INTERIOR NON-LOAD-BEARING	140	1	0
S-WALL-LOAD	24	WALLS - INTERIOR LOAD-BEARING	140	1	0
S-BRAC-SHEA	25	WALLS - SHEAR	140	1	0
S-WALL-RBAR	26	WALLS - REINFORCEMENT	4	2	0

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S-BRAC-LATL	27	BRACING - LATERAL	4	2	0
S-BRAC-VERT	28	BRACING - VERTICAL	4	2	0
S-SPPT-MISC	29	DEMOLITION - WALLS, ETC.	7	1	3
S-BEAM	30	BEAMS & GIRDERS	5	2	0
S-BEAM-CNTR	31	BEAM & GIRDER CENTERLINES	1	0	7
S-JOIS	32	OPEN WEB JOISTS & JOIST BRIDGING	15	2	0/4
S-ROOF-PRLN	33	ROOF PURLINS & WALL GIRTS	9	1	3
S-TRUS-UNIT	34	TRUSSES	15	2	0
S-FRAM-TCON	35	CONCRETE TEES & PLANK	4	1	0
S-MISC-METL	36	MISCELLANEOUS METALS	5	2	0
S-SPPT-MISC	37	MISC. FASTENERS, BOLTS, PLATES, ETC.	2	2	0
A-FLOR-CURB	38	CURBS, PADS, RAISED SLAB AREAS	0	1	0
S-DECK-WAFL	39	WAFFLE SLAB INDICATIONS	9	1	2
A-ANNO-SYMB	40	SYMBOLS, BUBBLES, TARGETS, ETC.	2,3	CELLS	CELLS
A-ANNO-MATC	41	MATCH, BREAK, & CENTERLINES	3	4/0/0	0/4
S-ANNO-ELEV	42	ELEVATIONS	3	1	FT=1
S-ANNO-FLOR	43	FLOOR DECK & ANNOTATION	2	1	FT=1
S-ANNO-ROOF	44	ROOF DECK & ANNOTATION	2	1	FT=1
A-ANNO-ROOM	45	ROOM NUMBERS	0	1	FT=1
A-ANNO-NOTE	46	NOTES, MISC. TEXT & LEADER LINES	3	1	0
A-DETL-TITL	47	DETAIL TITLES, SCALES, & BUBBLES	3	CELLS	CELLS
A-ANNO-SCHD	48	LEGEND & SCHEDULES (LINES & TEXT)	0,6	CELLS	CELLS
S-FLOR-GRPH	49	FINISH FLOOR LINES & TARGETS	3	CELLS	CELLS
A-ANNO-DIMS	50	DIMENSIONS & WITNESS LINES	4,0	1,0	Style
S-ANNO-DIM2	51	SECONDARY DIMENSIONS & WITNESS LINES	0	0	Style
S-STRC-52	52	User Definable.			
S-STRC-53	53	User Definable.			
S-STRC-54	54	User Definable.			
S-STRC-55	55	User Definable.			
S-STRC-56	56	User Definable.			
S-REFS-ARCH	57	REFERENCE NOTES, ARCHITECTURAL	9	1	FT=1
A-ANNO-ENGR	58	REFERENCE NOTES - ENGINEERING	0	0	FT=1
S-ANNO-KEYN	59	Keynotes and Specification Numbers	3	1	FT=1
A-WALL-CNTR	60	Wall Centerlines	1	0	3
A-ANNO-NPLT	61	NON-PLOT - CONSTRUCTION LINES	6	0	0
A-ANNO-REVS	62	ADDENDA NOTES & BULLETINS	3	1	0
S-ANNO-PATT	63	ALTERNATE PATTERN LEVEL			

TELECOMMUNICATIONS PLANS

Name	Level	Description	Color	Weight	Code
A-ANNO-TTLB	1	DRAWING SHEET EDGE & LINES	6	CELLS	CELLS
A-PLAN-KEYP	2	GRAPHIC SCALES & NORTH ARROWS	3,4	CELLS	CELLS
A-ANNO-TEXT	3	TITLE BLOCK TEXT	3,0	CELLS	CELLS
A-BLDG-OTLN	4	BUILDING OUTLINE (Footprint)	7	4	0
T-USER-5	5	User definable.			
T-SOUN-8DEV	6	SOUND / PA - DEVICE (1/8)	17	CELLS	CELLS
T-SOUN-NOTE	7	SOUND / PA - NOTES (1/8)	17	1	0

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T-SOUN-4DEV	8	SOUND / PA - DEVICES (1/4)	17	CELLS	CELLS
T-SOUN-CIRC	9	SOUND / PA - CIRCUITS	17	1	7
T- USER-10	10	User definable.			
T- PHON-OPCC	11	TELEPHONE - CAMPUS (1/8)	157	-	-
T- PHON-8NOT	12	TELEPHONE - LABEL/NOTE (1/8)	157	VARIES	VARIES
T-PHON-8DEV	13	TELEPHONE - DEVICE (1/8)	157	CELLS	CELLS
T-PHON-PANL	14	TELEPHONE - PANELS	157	CELLS	CELLS
T-PHON-4DEV	15	TELEPHONE - DEVICE (1/4)	157	CELLS	CELLS
T-PHON-4NOT	16	TELEPHONE - LABELS/NOTE (1/4)	157	1	0
T-PHON-CIRC	17	TELEPHONE - CABLES & CIRCUITS	157	1,2,4	0,5
T-USER-18	18	User definable.			
T-USER-19	19	User definable.			
T-CCTV-8DEV	20	TELEVISION - TRUNK DEVICE (1/8)	24	CELLS	CELLS
T-CCTV-8CIR	21	TELEVISION - TRUNK CIRCUIT (1/8)	VARIES	1,2,4	0,3,4,6
T-CCTV-8NOT	22	TELEVISION - TRUNK NOTES (1/8)	24	1	0
T-CCTV-TEXT	23	TELEVISION - TRUNK & DIST. TEXT	24	1	0
T-CCTV-4DEV	24	TELEVISION - DISTRIBUTION DEVICE (1/4)	36	CELLS	CELLS
T-CCTV-4CIR	25	TELEVISION - DISTRIBUTION CIRCUIT (1/4)	VARIES	1,2	
T-CCTV-4NOT	26	TELEVISION - DISTRIBUTION NOTES (1/4)	36	1	0
T-CNDT-CAMP	27	CONDUIT - CAMPUS - ALL TYPES	20	8	0,2
T-CNDT-INRD	28	CONDUIT - INTERDUCT - CAMPUS - ALL TYPES	67	8	0,2
T-CNDT-BLDG	29	CONDUIT - CONDUIT & INTERDUCT - BLDG.	9,20,67,9	VARIES	VARIES
T-CAMP-CIRC	30	DATA / LAN - CAMPUS CIRCUITS - COPPER	27	VARIES	VARIES
T-DATC-8NOT	31	DATA / LAN - NOTES - COPPER (1/8)	27	1	0
T-DATC-8DEV	32	DATA / LAN - DEVICES - COPPER (1/8)	27	CELLS	CELLS
T-DATC-PANL	33	DATA / LAN - PANELS - COPPER	27	CELLS	CELLS
T-DATC-4DEV	34	DATA / LAN - DEVICES - COPPER (1/4)	27	CELLS	CELLS
T-DATC-4NOT	35	DATA / LAN - NOTES - COPPER (1/4)	27	1	0
T-DATC-CIRC	36	DATA / LAN - CIRCUITS - COPPER	27	1,2,4	0,5
T-DATF-CMPF	37	DATA / LAN - CAMPUS CIRCUITS - FIBER	42	VARIES	VARIES
T-DATF-8NOT	38	DATA / LAN - NOTES - FIBER (1/8)	42	1	0
T-DATF-8DEV	39	DATA / LAN - DEVICES - FIBER (1/8)	42	CELLS	CELLS
A-ANNO-SYMB	40	SYMBOLS, BUBBLES, TARGETS, ETC.	2,3	CELLS	CELLS
A-ANNO-MATC	41	MATCH, BREAK, & CENTERLINES	3	4/0/0	0/4
T-DATF-PANL	42	DATA / LAN - PANELS - FIBER	42	CELLS	CELLS
T-DATF-4DEV	43	DATA / LAN - DEVICES - FIBER (1/4)	42	CELLS	CELLS
T-DATF-4NOT	44	DATA / LAN - NOTES - FIBER (1/4)	42	1	0
T-DATF-CIRC	45	DATA / LAN - CIRCUITS & CABLE - FIBER	42	1,2,4	0,5
A-ANNO-NOTE	46	NOTES, MISC. TEXT & LEADER LINES	3	1	0
A-DETL-TITL	47	DETAIL TITLES, SCALES, & BUBBLES	3	CELLS	CELLS
A-ANNO-SCHD	48	LEGEND & SCHEDULES (LINES & TEXT)	0,6	CELLS	CELLS
T-USER-49	49	User definable.			
A-ANNO-DIMS	50	DIMENSIONS & WITNESS LINES	4,0	1,0	Style
T-CLOK-CIRC	51	CLOCK/BELL - CIRCUITS	219	-	-
T-CLOK-8DEV	52	CLOCK/BELL - DEVICES (1/8)	219	CELLS	CELLS
T-CLOK-8NOT	53	CLOCK/BELL - NOTES (1/8)	219	1	0
T-CLOK-4DEV	54	CLOCK/BELL - DEVICES (1/4)	219	CELLS	CELLS
T-CLOK-4NOT	55	CLOCK/BELL - NOTES (1/4)	219	1	0

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T-RESV-56	56	RESERVED - SECURITY			
T-RESV-57	57	RESERVED - SECURITY			
A-ANNO-ENGR	58	REFERENCE NOTES - ENGINEERING	0	0	FT=1
T-RESV-59	59	RESERVED - SECURITY			
T-RESV-60	60	RESERVED - SECURITY			
A-ANNO-NPLT	61	NON-PLOT - CONSTRUCTION LINES	6	0	0
A-ANNO-REVS	62	ADDENDA NOTES & BULLETINS	3	1	0
T-PTRN*	63	ALTERNATE PATTERNS	0	0	0

UTILITIES PLANS

Name	Level	Description	Color	Weight	Code
A-ANNO-TTLB	1	DRAWING SHEET EDGE & LINES	6	CELLS	CELLS
A-PLAN-KEYP	2	GRAPHIC SCALES & NORTH ARROWS	3,4	CELLS	CELLS
A-ANNO-TEXT	3	TITLE BLOCK TEXT	3,0	CELLS	CELLS
A-BLDG-OTLN	4	BUILDING OUTLINES (Footprints)	12	2	0
U-SITE-PRIM	5	ELECTRIC SERVICE - ALL PRIMARIES	5	2	0
U-SITE-SCND	6	ELECTRIC SERVICE - ALL SECONDARY	4	2	0
U-SITE-LITE	7	ELECTRIC SERVICE - ALL LIGHTING LINES	4	2	0
U-SITE-LITX	8	ELECTRIC SERVICE - ALL LIGHTING FIXTURES	4	CELLS	CELLS
U-SITE-DEVC	9	ELECTRIC SERVICE - METERS, GROUNDS, ...	5	2	0
U-SITE-DUCT	10	ELECTRIC SERVICE - DUCTBANKS	2	1	0
U-SITE-JUNC	11	ELECTRIC SERVICE - J. BOXES & MANHOLES	3	CELLS	CELLS
U-SITE-TRAN	12	ELECTRIC SERVICE - ALL TRANSFORMERS	5	2	0
U-SITE-ABDN	13	ELECTRIC SERVICE - ABANDONED LINES	5	2	2
U-USER-14	14	User definable.			
U-POLE	15	ALL POLE INFORMATION & Traffic controls	2 & 23	1	0
U-GUYW	16	ALL GUY WIRES	2	1	0
U-TELE	17	ALL TELEPHONE INFORMATION.	7	1	0
U-SANR-PIPE	18	SANITARY PIPES	9	1	2
U-SANR-MNHL	19	SANITARY MANHOLES	9	1	0
U-DOMW	20	DOMESTIC WATER - ALL PIPING INFO.	1	2	2
U-DOMW-DEVC	21	DOMESTIC WATER - CONNECTORS, VALVES, ..	1	CELLS	CELLS
U-DOMW-JUNC	22	DOMESTIC WATER - J. BOXES & MANHOLES	1	1	0
U-DOMW-PITS	23	DOMESTIC WATER - ALL PIT INFO.	1	1	0
	24	Grates & Gratings	54	0	Cells
U-HTCW	25	HOT/COLD WATER - ALL PIPING INFO.	15	2	2
U-HTCW-DEVC	26	HOT/COLD WATER - CONNECTORS, VALVES, ..	15	CELLS	CELLS
U-HTCW-JUNC	27	HOT/COLD WATER - J. BOXES & MANHOLES	15	1	0
U-HTCW-PITS	28	HOT/COLD WATER - ALL PIT INFO.	15	1	0
	29				
U-GASP	30	GAS UTILITIES - ALL PIPING INFO.	10	2	2
U-GASP-DEVC	31	GAS UTILITIES - CONNECTORS, VALVES, ..	10	CELLS	CELLS
U-GASP-JUNC	32	GAS UTILITIES - J. BOXES & MANHOLES	10	1	0
U-GASP-PITS	33	GAS UTILITIES - ALL PIT INFO.	10	1	0
	34				
U-FUEL	35	FUEL SYSTEMS - ALL PIPING INFO	10	2	2
U-FUEL-DEVC	36	FUEL SYSTEMS - CONNECTORS, VALVES, ..	10	CELLS	CELLS

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U-FUEL-JUNC	37	FUEL SYSTEMS - J. BOXES & MANHOLES	10	1	0
U-FUEL-PITS	38	FUEL SYSTEMS - ALL PIT INFO.	10	1	0
U-USER-39	39	<i>User definable.</i>			
A-ANNO-SYMB	40	SYMBOLS, BUBBLES, TARGETS, ETC.	2,3	CELLS	CELLS
A-ANNO-MATC	41	MATCH, BREAK, & CENTERLINES	3	4/0/0	0/4
U-IRRG-PIPE	42	<i>IRRIGATION PIPES & Control Box</i>	7 / 134	1	0
U-IRRG-SPKL	43	<i>IRRIGATION SPRINKLER HEADS</i>	1	1	0
C-FIRE	44	<i>Fire Protection - Hydrants, connections</i>	4	2	0
C-FIRE-UNDR	45	<i>Fire Protection - Underground lines</i>	4	2	4
A-ANNO-NOTE	46	NOTES, MISC. TEXT & LEADER LINES	3	1	0
A-DETL-TITL	47	DETAIL TITLES, SCALES, & BUBBLES	3	CELLS	CELLS
A-ANNO-SCHD	48	LEGEND & SCHEDULES (LINES & TEXT)	0,6	CELLS	CELLS
U-USER-49	49	<i>User definable.</i>			
A-ANNO-DIMS	50	DIMENSIONS & WITNESS LINES	4,0	1,0	Style
U-USER-51	51	<i>User definable.</i>			
U-USER-52	52	<i>User definable.</i>			
U-USER-53	53	<i>User definable.</i>			
U-USER-54	54	<i>User definable.</i>			
U-USER-55	55	<i>User definable.</i>			
U-STRM-UNDR	56	<i>STORM DRAINS (PIPING) & Cleanouts</i>	7 / 134	2	1
U-STRM-MNHL	57	<i>STORM MANHOLES</i>	7	2	1
A-ANNO-ENGR	58	<i>REFERENCE NOTES - ENGINEERING</i>	0	0	FT=1
C-SITE-TUNL	59	<i>Underground Tunnels</i>	9	1	2
U-STEM-MNHL	60	STEAM MANHOLES			
A-ANNO-NPLT	61	NON-PLOT - CONSTRUCTION LINES	6	0	0
A-ANNO-REVS	62	ADDENDA NOTES & BULLETINS	3	1	0
U-USER-63	63				

SECURITY PLANS

Name	Level	Description	Color	Weight	Code
A-ANNO-TTLB	1	DRAWING SHEET EDGE & LINES	6	CELLS	CELLS
A-PLAN-KEYP	2	GRAPHIC SCALES & NORTH ARROWS	3,4	CELLS	CELLS
A-ANNO-TEXT	3	TITLE BLOCK TEXT	3,0	CELLS	CELLS
A-BLDG-OTLN	4	BUILDING OUTLINE (Footprint)	12	2	0
QY-FLOR-AREA	5	ROOM PERIMETERS	57	2	0
QY-FLOR-OTLN	6	EXTERIOR FLOOR PERIMETER	7	2	0
QY-USER-7	7	<i>User definable.</i>			
QY-USER-8	8	<i>User definable.</i>			
QY-USER-9	9	<i>User definable.</i>			
QY-USER-10	10	<i>User definable.</i>			
QY-ACCC-EXTR	11	ACCESS CONTROL - EXT. MOUNTED DEV.	2	1	0
QY-ACCC-PANL	12	ACCESS CONTROL - UNITS/PANELS	2	1	0
QY-ACCC-WALL	13	ACCESS CONTROL - WALL-MTD. DEVICES	2	1	0
QY-ANCN-PANL	14	ANNUNCIATION - CONTROL UNIT/PANEL	2	1	0
QY-ANCN-RESN	15	ANNUNCIATION - REMOTE STATIONS	2	1	0
QY-USER-16	16	<i>User definable.</i>			
QY-BARR-FENC	17	BARRIERS - FENCES/GATES	5	2	0
QY-BARR-SENS	18	BARRIERS - SENSORS	2	1	0

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QY-BARR-WALL	19	BARRIERS - WALLS	5	5	0
QY-DEMO-HAZM	20	DEMOLITION - HAZARDOUS MATERIALS	5	2	0
QY-COMM-CLNG	21	COMMUNICATION - CEILING MTD.	2	1	0
QY-COMM-INTC	22	COMMUNICATION - INTERCOM/SPEAKERS	2	1	0
QY-COMM-PANL	23	COMMUNICATION - PANELS	2	1	0
QY-COMM-WALL	24	COMMUNICATION - WALL MTD.	2	1	0
QY-USER-25	25	<i>User definable.</i>			
QY-SWCH-FLSH	26	SECURITY SWITCH - FLUSH MTD.	2	1	0
QY-SWCH-SURF	27	SECURITY SWITCH - SURFACE MTD.	2	1	0
QY-USER-28	28	<i>User definable.</i>			
QY-USER-29	29	<i>User definable.</i>			
QY-SENS-BURD	30	SENSORS - BURIED	2	1	2
QY-SENS-CLNG	31	SENSORS - CEILING MTD.	2	1	0
QY-SENS-FLOR	32	SENSORS - FLOOR MTD.	2	1	0
QY-SENS-GLAS	33	SENSORS - GLASS/FOIL MTD.	2	1	0
QY-SENS-PANL	34	SENSORS - CONTROL UNITS/PANELS	2	1	0
QY-SENS-WALL	35	SENSORS - WALL MTD.	2	1	0
QY-USER-36	36	<i>User definable</i>			
QY-USER-37	37	<i>User definable.</i>			
QY-USER-38	38	<i>User definable.</i>			
QY-USER-39	39	<i>User definable.</i>			
A-ANNO-SYMB	40	SYMBOLS, BUBBLES, TARGETS, ETC.	2,3	CELLS	CELLS
A-ANNO-MATC	41	MATCH, BREAK, & CENTERLINES	3	4/0/0	0/4
QY-LITE-CLNG	42	SECURITY LIGHTING - CEILING MTD.	2	1	0
QY-LITE-PLOE	43	SECURITY LIGHTING - POLE MTD.	2	1	0
QY-LITE-WALL	44	SECURITY LIGHTING - WALL MTD.	2	1	0
QY-USER-45	45	<i>User definable.</i>			
A-ANNO-NOTE	46	NOTES, MISC. TEXT & LEADER LINES	3	1	0
A-DETL-TITL	47	DETAIL TITLES, SCALES, & BUBBLES	3	CELLS	CELLS
A-ANNO-SCHD	48	LEGEND & SCHEDULES (LINES & TEXT)	0,6	CELLS	CELLS
QY-USER-49	49	<i>User definable.</i>			
A-ANNO-DIMS	50	DIMENSIONS & WITNESS LINES	4,0	1,0	Style
QY-LOCK-ELEC	51	LOCKING DEVICES - ELECTRICAL	2	1	VARIES
QY-LOCK-MANL	52	LOCKING DEVICES - MANUAL	2	1	VARIES
QY-WIRE-SYST	53	SECURITY WIRING & CIRCUITS	1	0	VARIES
QY-STAT-DEMO	54	STATUS - DEMOLITION	5	2	2
QY-STAT-EXST	55	STATUS - EXISTING TO REMAIN	4	2	0
QY-STAT-FTUR	56	STATUS - FUTURE WORK	4	2	7
QY-STAT-MOVE	57	STATUS - ITEMS TO BE MOVED	5	2	5
QY-STAT-NEWW	58	STATUS - NEW WORK	7	3	0
QY-STAT-RELO	59	STATUS - RELOCATED ITEMS	1	0	2
QY-STAT-TEMP	60	STATUS - TEMPORARY	7	3	4
A-ANNO-NPLT	61	NON-PLOT - CONSTRUCTION LINES	6	0	0
A-ANNO-REVS	62	ADDENDA NOTES & BULLETINS	3	1	0
QY-ANNO-PATT	63	PATTERNS	0	0	0

PROJECT ESTIMATE (SMALL PROJECTS)

Project File Number: _____ Project Type: _____ Budget: _____

Title: _____

Construction (Contract):

Building Cost (Sq.ft unit cost): _____
Demolition (Sq.ft. Unit cost): _____
Construction Contingency (25%) _____
Other: _____

Total Construction Contract: _____

Equipment & Furnishings:

Equipment/Furnishings: _____
Other: _____

Total Equipment & Furnishings: _____

Project Expenses:

Relocated Parking: _____
Construction Compound: _____
Other Special Costs: _____

Total Project Expenses: _____

Professional/Support Fees:

A/E Fees: _____
Government Consultants: _____
Construction Management (8%) _____
Testing & Fees: _____

Total Professional/Support Fees: _____

Total Project Budget: _____

PROJECT ESTIMATE SUMMARY (Schematic Phase)

Project File Number: _____ Anticipated Construction Dates: _____
 Title: _____
 A/E: _____ Date of Est.: _____

Division of Work	Quantity	Unit Rate	Total	Cost/ Sq.Ft.	% of Cost
A Substructure	_____	CF	_____	_____	_____
B Shell	_____		_____	_____	_____
Superstructure	_____		_____	_____	_____
Exterior Closure	_____	SF	_____	_____	_____
Roofing	_____	SF	_____	_____	_____
C Interiors	_____	SF	_____	_____	_____
D Services	_____		_____	_____	_____
Conveying Systems	_____	Stories	_____	_____	_____
HVAC	_____	MCF	_____	_____	_____
Plumbing	_____	SF	_____	_____	_____
Fire Suppression	_____	SF	_____	_____	_____
Electrical	_____		_____	_____	_____
<i>Service & Distribution</i>	_____	SF	_____	_____	_____
<i>Lighting & Power</i>	_____	SF	_____	_____	_____
<i>Special Electrical</i>	_____	SF	_____	_____	_____
E Equipment & Furnishings	_____	SF	_____	_____	_____
F Other Building Construction	_____	SF	_____	_____	_____
HazMat	_____	SF	_____	_____	_____
G Building Sitework	_____	SF	_____	_____	_____
Sub-Totals:	_____		_____	_____	_____
Markups	_____		_____	_____	_____
Off Hours Costs (define)	_____		_____	_____	_____
Labor Burden	_____	%	_____	_____	_____
SC OH&P	_____	%	_____	_____	_____
GC OH&P	_____	%	_____	_____	_____
Design Contingency (20%)	_____	%	_____	_____	_____
Escalat'n to Const. Midpoint	_____	%	_____	_____	_____
Total Construction (Est. Bid):	_____		_____	_____	_____
Construction Contingency	_____	%	_____	_____	_____
A/E Professional Services	_____	%	_____	_____	_____
Construction Management	_____	%	_____	_____	_____
Gov't. Testing & Inspect.	_____	%	_____	_____	_____
Total Project Costs	_____		_____	_____	_____

PROJECT ESTIMATE SUMMARY (Design Development)

Project File Number: _____ Anticipated Construction Dates.: _____
 Title: _____
 A/E: _____ Date of Est.: _____

Division of Work		Quantity	Unit Rate	Total	Cost/ Sq.Ft.	% of Cost
A	SUBSTRUCTURE					
A1011	Standard Foundations		SF			
A1020	Special Foundations		LF			
A1030	Slab on Grade		SF			
A2010	Basement Excavation		CF			
A2020	Basement Walls		SF			
B	SHELL					
B1010	Floor Construction		SF			
B1020	Roof Construction		SF			
B2010	Exterior Walls		SF			
B2020	Exterior Windows		SF			
B2030	Exterior Doors		SF			
B3010	Roof Coverings		SF			
B3020	Roof Openings		SF			
C	INTERIORS					
C1010	Interior Partitions		SF			
C1020	Interior Doors		SF			
C1030	Interior Specialties		SF			
C2010	Stair Construction		FLT			
C2020	Stair Finishes					
C3010	Interior Wall Finishes		SF			
C3020	Interior Floor Finishes		SF			
C3030	Interior Ceiling Finishes		SF			
D	SERVICES					
D10	Conveying System		STORY			
D2010	Plumbing Fixtures		FIXT			
D2020	Domestic Water Dist.					
D2030	Sanitary Waste Systems					
D2040	Rain Water Drainage Sys.					
D2050	Special Plumbing Fixtures					
D3010	Fuel Supply Systems					
D3020	Heat Generation Sys.					
D3030	Heat Rejection Sys.					

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Division of Work		Quantity	Unit Rate	Total	Cost/ Sq.Ft.	% of Cost
D3040	Heat Distribution Sys.					
D3050	Heat Transfer					
D3060	HVAC Controls Instrument.					
D3070	Spec. HVAC Sys. & Equip.					
D3080	HVAC Test, Adj. & Balance					
D40	Fire Protection Systems					
D5010	Electrical Service & Dist.					
D5020	Lighting & Branch Wiring					
D5030	Comm. & Security Sys,					
D5040	Special Electrical Sys.		FIXT			
D5050	Elect. Controls & Instruments		SF			
D5060	Electrical Testing		SF			
E	EQUIPMENT & FURNISHINGS					
E10	Equipment					
E20	Furnishings					
F	OTHER BUILDING CONSTRUCTION					
F10	Special Construction					
F20	Selective Demolition					
	HazMat					
G	BUILDING SITEWORK					
G	Site Preparation					
G20	Site Improvements					
G30	Site Plumbing Utilities					
G40	Site HVAC Utilities					
G50	Site Electrical Utilities					
G60	Other Site Construction					
Markups:						
	Off Hours Cost (define)		%			
	Labor Burden		%			
	SC OH&P		%			
	GC OH&P		%			
	Design Contingency (20%)		%			
	Escalat'n to Const. Midpoint		%			
Total Construction Costs:						
	Construction Contingency		%			
	Professional Services		%			
	Construction Management		%			
	Gov't. Testing & Inspect.		%			
Total Project Costs:						

PROJECT ESTIMATE SUMMARY (Construction Documents)
(Sample Work Breakdown - Define Work Items to Suit Project)

Project File Number: _____ Anticipated Construction Dates: _____
Title: _____
A/E: _____ Date of Est: _____

Division of Work		Quantity	Unit Rate	Total	Cost/ Sq. ft.	% of Cost
A	SUBSTRUCTURE					
A10	FOUNDATIONS					
A1010	Standard Foundations					
A1020	Special Foundations					
A1030	Slabs on Grade					
A20	BASEMENT CONSTRUCTION					
A2010	Basement Excavation					
A2020	Basement Walls					
B	SHELL					
B10	SUPERSTRUCTURE					
B1010	Floor Construction					
B1020	Roof Construction					
B20	EXTERIOR CLOSURE					
B2010	Exterior Walls					
B2020	Exterior Windows					
B2030	Exterior Doors					
B30	ROOFING					
B3010	Roof Coverings					
B3020	Roof Openings					
C	INTERIORS					
C10	INTERIOR CONSTRUCTION					
C1010	Interior Partitions					
C1020	Interior Doors					
C1030	Interior Specialties					
C20	STAIRWAYS					
C2010	Stair Construction					
C2020	Stair Finishes					
C30	INTERIOR FINISHES					
C3010	Interior Wall Finishes					
C3020	Interior Floor Finishes					

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Division of Work		Quantity	Unit Rate	Total	Cost/ Sq. ft.	% of Cost
C3030	Interior Ceiling Finishes					
D	SERVICES					
D10	Conveying Systems					
D20	Plumbing Systems					
D2010	Plumbing Fixtures					
D2020	Domestic Water Distribution					
D2030	Sanitary Waste Systems					
D2040	Rain Water Drainage Systems					
D2050	Special Plumbing Systems					
D30	HVAC SYSTEMS					
D3010	Fuel Supply Systems					
D3020	Heat Generation Systems					
D3030	Heat Rejection Systems					
D3040	Heat Distribution Systems					
D3050	Heat Transfer					
D3060	HVAC Controls & Instrumentation					
D3070	Special HVAC Systems & Equip.					
D3080	HVAC Sys. Testing, Adjusting & Bal.					
D40	FIRE PROTECTION SYSTEMS					
D4010	Fire Protection Sprinkler Sys.					
D4020	Standpipe & Hose Systems					
D4030	Fire Protection Specialties					
D4040	Special Fire Protection Sys,					
D50	ELECTRICAL SYSTEMS					
D5010	Electrical Service & Distribution					
D5020	Lighting & Branch Wiring					
D5030	Communication & Security Systems					
D5040	Special Electrical Systems					
D5050	Electrical Controls & Instrumentation					
D5060	Electrical Testing					
E	EQUIPMENT & FURNISHINGS					
E10	Equipment					
E1010	Commercial Equipment					
E1020	Institutional Equipment					
E1030	Vehicular Equipment					
E1040	Other Equipment					

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Division of Work		Quantity	Unit Rate	Total	Cost/ Sq. ft.	% of Cost
E20	FURNISHINGS					
E2010	Fixed Furnishings					
E2020	Movable Furnishings					
F	OTHER BUILDING					
F10	SPECIAL CONSTRUCTION					
F20	SELECTIVE DEMOLITION					
F2010	Building Elements Demolition					
F2020	Hazardous Components Abatement					
G	BUILDING SITE WORK					
G10	SITE PREPARATION					
G1010	Subsurface Investigation					
G1020	Site Clearing					
G1030	Site Demolition & Relocations					
G1040	Site Earthwork					
G1050	Hazardous Waste Remediation					
G20	SITE IMPROVEMENT					
G2010	Roadways					
G2020	Parking Lots					
G2030	Pedestrian Paving					
G2040	Site Development					
G2050	Landscaping					
	Sub-Totals:					
Markups						
	Off Hours Costs (define)		%			
	Labor Burden		%			
	SC OH&P		%			
	GC OH&P		%			
	Design Contingency (5-0%)		%			
	Escalat'n to Const.		%			
Total Construction (Est. Bid):						
	Construction Contingency		%			
	Professional Services		%			
	Construction Management		%			
	Gov't. Testing & Inspect.		%			
Total Project Costs:						



AOC DESIGN STANDARDS

Architect of the Capitol Requirements for: the Design of Congressional Offices and Facilities

October 1, 2002 (Rev. June, 2004)

Alan M. Hantman, FAIA
Architect of the Capitol
United States Capitol
Washington, D.C. - 20515

Documents contained in this Standard:

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B102	Roof Construction - <i>Structural frames, interior supporting walls, decks, slabs, and sheathing, canopies, vapor retarders & insulation, fireproofing & firestopping.</i>	6/04	C103	Interior Specialties - <i>Compartments & cubicles, wall & corner guards, lockers, storage shelving, toilet & bath accessories, & other.</i>	(Fut.)
B200	EXTERIOR CLOSURE		C1032	Compartments & Cubicles	6/04
B201	Exterior Walls - <i>Exterior skin, wall construction, vapor barriers & insulation, parapets, louvers & grilles, balcony walls & railings, & soffits.</i>	10/02	C1037	Lockers	6/04
B2011	Exterior Stone	10/02	C1038	Toilet Accessories	6/04
B2018	Exterior Balcony Walls & Railings	10/02	C200	STAIRWAYS	6/04
B202	Exterior Windows - <i>Standard windows, storefronts, glazed curtain walls, & special windows.</i>	10/02	C201	Stair Construction - <i>Cast-in-place, pre-cast, & metal stairs.</i>	(Fut.)
B203	Exterior Doors - <i>Entrance doors, utility, special use, & gates.</i>	6/04	C202	Stair Finishes - <i>Tile, terrazzo, stone, resilient & special flooring finishes, & railings.</i>	(Fut.)
B300	ROOFING	6/04	C300	INTERIOR FINISHES	
B301	Roof Coverings - <i>Shingles & roofing tiles, membrane roofing, horizontal waterproofing, sheet metal roofing, flashing & sheet metal, roof specialties & accessories.</i>	(Fut.)	C301	Interior Wall Finishes - <i>Concrete, plaster, gypsum board tile, painting, & special finishes.</i>	10/02
B3014	Membrane Roofing	10/02	C3019	Interior Wall Painting	10/02
B3016	Sheet Metal Roofing	10/02	C302	Interior Floor Finishes - <i>Concrete, tile, terrazzo, wood, stone, resilient, & carpet finishes, & access flooring.</i>	10/02
B3017	Flashing & Sheet Metal	10/02	C3021	Concrete Floor Finishes	10/02
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			C303	Interior Ceiling Finishes - <i>Plaster, gypsum board, acoustical, painting & special coatings.</i>	10/02
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C102	Interior Doors - <i>Swinging & entrance doors, sliding, fire-rated, & special use.</i>	10/02	D1010	Elevators	10/02
			D1011	Escalators	10/02
			D102	Other Transportation Systems	N.A.
			D103	Other Conveying Systems - <i>Material handling systems, hoists & cranes, & scaffolding.</i>	(Fut.)

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D200	PLUMBING SYSTEMS		D402	Standpipe & Hose Systems -	6/04
D201	Plumbing Fixtures - <i>Water closets, urinals, lavatories, sinks, etc.</i>	10/02		<i>Standpipe & valves, hoses, & cabinets.</i>	
D202	Domestic Water Systems - <i>Supply piping systems, equipment, & supply insulation.</i>	6/04	D4030	Fire Protection Specialties - <i>Extinguishers, blankets, and cabinets.</i>	6/04
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D301	Fuel Supply Systems - <i>Oil, gas, coal & other supply systems.</i>	(Fut.)	D5011.1	Network Transformers	6/04
D302	Heat Generation Systems - <i>Steam boilers, hot water boilers, & fuel-fired heaters.</i>	10/02	D5011.2	Network Protectors	6/04
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D304	Heat Distribution Systems - <i>Air, steam, & hydronic distribution, & exhaust systems.</i>	(Fut.)	D5013.8	Bus Ducts	6/04
D3041	Air Distribution Systems	6/04	D5015	Branch Circuit Panelboards	6/04
D3042	Steam Distribution Systems	6/04	D5017	Motor Control Centers	10/02
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- 004 Maintenance Precepts - *Service, repair, replacement, and equipment rooms.*
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0000 - INTRODUCTION

Purpose: This manual provides guidance to AOC Staff designers and to Associate Architect/Engineers (A/Es) designing facilities for the Architect of the Capitol. It is offered to establish baseline standards necessary to raise commercial levels of practice to the Monumental/Institutional standards required of the United States Capitol Complex. The goal is both to secure facilities with appropriate life spans and with proper concern to operation and maintenance needs without sacrificing the stewardship role with which the AOC is entrusted. Our people maintain what we design.

Applicability: These standards apply to all Congressional Facilities and Grounds and to those facilities of the Supreme Court under the jurisdiction of the Architect of the Capitol. Any deviations from these standards shall be approved in writing by the AOC Project Manager. These standards apply, as noted, to Principal Buildings, Support Buildings, and Service Buildings. Temporary facilities may have deviations for specific provisions on a case-by-case basis, as approved by the AOC Project Manager.

Format: This Manual is divided into eight parts, closely tracking the industry standard “Uniformat” system, which was originally developed under contract for the General Services Administration (GSA) and is now maintained by the Construction Specifications Institute (CSI). The exception to the system is that Part Z has been renamed as Part 0, General, and moved to the beginning of the Manual. Within each part, data is classified generally by Uniformat number. Where applicable, references to supporting documents utilize the CSI’s 16-Division “MasterFormat” system. Each data element insert within a given Part is numbered individually.

Terminology: The content of this manual reflects adopted practices of the Architect of the Capitol and provisions stated with “shall” or “must” shall be interpreted as being mandatory. In addition, the imperative mood is also used to express mandatory provisions. Provisions stated with the phrases “should” or “may” may be interpreted as being recommended or connoting a selection to be made from applicable options. Refer any questions of interpretation to the AOC Project Manager or the Technical Support Division.

Acknowledgments: To promote consistency, where practicable, the Office of the Architect of the Capitol has utilized provisions of *Facilities Standards for the Public Buildings Service* (PBS-P100), published by the General Services Administration. The AOC wishes to acknowledge the assistance of Ms. Margaret A. McDermott, Assistant Director of Facilities Planning and Construction, University of Delaware, for her assistance in developing the standard’s page and data format. We have also found sound advice in standards published by the University of California, Ohio State University, Virginia Polytechnic Institute and State University, the State of Illinois Capital Development Board, the State of Washington, and construction agencies of the Department of Defense.

Evolution: Enhancements and revisions are invited and will be incorporated based on design feedback and on operations and maintenance data provided by the AOC CAFM system. Suggestions for improvements should be addressed to: Technical Support Division, U.S. Architect of the Capitol, Washington, DC 20515.

0001 - GENERAL

DESIGN REQUIREMENTS

Quality of Architectural/Engineering Design: To quote the General Services Administration - “Excellence in architectural design is a prime goal of the Government.” The designs of new facilities should not detract from those that exist presently and designs for renovations should seek to preserve the character and history of the Capitol Complex.

- **Dignity** - Design shall reflect the dignity that the Citizens of the United States accord their Congress.
- **Long Life** - Major facilities are designed for extremely long lives. Provide for flexibility to allow for future change throughout the life of the building.
- **Maintenance** - The AOC requires that projects maximize program features and minimize maintenance requirements.
- **Security** - Provisions to maintain the security of the facilities and the occupants thereof shall be included in all designs.

General Precepts: The design details and product specifications should reflect proven technology and recognized performance standards. All design shall conform with referenced codes and standards. To the maximum extent possible, projects should be designed using generic products and should minimize the use of brand names. The designer’s work will be reviewed by all appropriate design disciplines within the AOC for conformance with project scope and program requirements, referenced codes, and standards. While the AOC may provide technical comments to the designer, the technical accuracy of the project and the coordination of design between disciplines is solely the responsibility of the Associate A/E.

- **Coordination:** To the extent possible, these design standards have been coordinated with AOC Guide Specifications and AOC Solution Order Contracting (SOC) requirements. Please report any conflicts or ambiguities to the Technical Support Division.

Requirement for Computerized Design: The AOC requires design utilizing computer aided design systems for graphics and associated engineering calculations. Unless specifically stated otherwise all design documents shall be submitted using Bentley Systems *MicroStation* software. Comply with requirements of the AOC *A/E Design Manual - Requirements for Associate Architects/Engineers Design Contracts*.

Geodetic Datum: The AOC uses the District of Columbia Engineer’s Department datum for all vertical elevations. Horizontal control observes the Maryland State Coordinate System.

- **D.C. Engineers Datum:** Zero = +2.11 ft. above low water in Washington Harbor.
- **Capitol Bench Mark:** DC= +89.84 ft.
- The Capitol Bench Mark is the apex of a bronze bolt set in the east window sill of the south side of the Senate Wing of the U.S. Capitol. The bolt was placed in position in 1894 and is inscribed “Capitol B.M.” (Formally approved February 10, 1999, Alan M. Hantman, FAIA, Architect of the Capitol.).

RESTRICTIONS

- This document is for projects delivered under the jurisdiction of the Architect of the Capitol.

RELATED DOCUMENTS

- | • *AOC A/E Design Manual* - [February, 2004](#).
- *AOC Project Manager Manual* - September 1, 2000.
- *AOC CAD User Manual* - July 1, 1998.
- | • *AOC Pre-Design Manual* - [February, 2004](#).

AGENCY CONTACT - Mr. Bruce Arthur, Director Architecture Division, or Mr. John Weber, Director, Technical Support Division - (202) 225-5900.

0002 - BUILDING STANDARDS

DESIGN REQUIREMENTS

Building Quality Levels: The AOC has adapted GSA quality levels to correspond to the design and construction activities required within the Congressional Complex. Specifically, the AOC classifies buildings within three categories: Principal Buildings, Support Buildings, and Service Buildings.

Building Class	Description	Included Buildings
Principal	Major, monumental buildings of historic significance and characterized by very long service lives (100 years +). These buildings typically directly house activities of Senators, Members of Congress and Supreme Court Justices, or house related agencies. Major public presence must be accommodated.	U.S. Capitol; U.S. Supreme Court; Russell Senate Office Bldg.; Dirksen Senate Office Bldg.; Hart Senate Office Bldg.; Cannon House Office Bldg. ; Rayburn House Office Bldg.; Longworth House Office Bldg.; T. Jefferson Building; J. Adams Building; J. Madison Bldg.; U.S. Botanic Garden Conservatory;
Support	Buildings of long service life (50 - 100 years) that support staff and related activities of the Congress, the Library of Congress or the Supreme Court. These buildings benefit from the use of durable materials with low-maintenance but not of the finish levels provided for Principal Buildings.	Ford House Office Building; Eney, Chestnut, Gibson Memorial Building; CPP Administration Building; Botanic Garden Administration Bldg.; Senate Underground Garage; House Underground Garages; Capitol Power Plant buildings; ...
Service	Buildings with service lives of 25 to 50 years. Utilitarian buildings that support service and maintenance functions, generally requiring low maintenance finishes and materials more consistent with standard commercial practice.	E Street Garage; Off-Site Inspection Center; Warehousing; House and Senate Page Dormitories; Day Care Centers; BG Head House; LOC Special Facility Center; all LOC facilities at Ft. Meade; Dog Kennels.

- Temporary construction shall be designed to designated service lives.

Service Life Expectancies: The AOC will define expected Design Life of the Building in the [Program of Requirements](#). [Projects shall be designed](#) to conform to the following service life and quality expectancies adapted from GSA and Washington State guidelines:

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Style	Principal	Support	Service
Life Cycle	100 years +	50-100 years	25-50 years
Inaccessible or Structural Components	100 years	50 years	20 years
Components where replacement is expensive or difficult (Includes below-ground drainage)	50 years	50 years	20 years
Major replaceable components	25 years	25 years	20 years
Services, installations, and external works	25 years	20 years	20 years
Space Efficiency Targets	60%	70%	80%
Lobby Space	Major (GSA 'A')	Proper (GSA 'B')	Efficiency ('C')
Special Spaces:	Cafeteria	Cafeteria	Snack bar *
	Auditorium	Auditorium	Auditorium *
	Post Office	Post Office	No
SHELL			
Floor height - First floor	15-25	15-20	15
Other floors	14-15	13	12
Spans	35-40	30-35	25-30
Module	5 ft.	5 ft.	5 ft.
Live load (general areas)	125 psf	125 psf	80 psf **
Material Quality	Granite/marble	Limestone/brick	Brick/precast
Fenestration	Bronze	Anodized alum.	Anodized alum.
Glazing (New facilities ***)	Solar insulated	Insulated	Insulated
Operable windows	Pivoted	Pivoted	Sliding/hopper
Percent fenestration ***	up to 50%	up to 40%	up to 30%
INTERIORS			
Material Quality - General	Marble	Stone	Masonry
Lobbies	Terrazzo/marble	Ceramics	Plaster/wood
Corridors	Terrazzo/marble	*	0
Toilets & Restrooms	Terrazzo/marble	Ceramics	Plaster/tile/wood
Partitioning	Masonry/plastered	Gyp.Dry./acous.	Gyp.dry./acous.
Ceilings	Plastered	Acoustic	Acoustic

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Style	Principal	Support	Service
SERVICES			
Accessibility	Yes	Yes	Yes
Elevators/escalators	Yes	Yes	Yes
HVAC Split loads			
Wall mounted plumbing fixtures	Yes	Yes	Sometimes
Expansion capability	Yes	Yes	Sometimes
Motor control centers	Yes	Yes	Usually
Emergency generators	Yes	Yes	Sometimes
Security system	Yes	Yes	Sometimes
Fire Alarm system	Yes	Yes	Yes
Sprinklers	Yes	Yes	Usually
EQUIPMENT AND FURNISHINGS			
Outfit special purpose space	Yes	Yes	Yes
Loading Dock levelers	Yes	Yes	Yes
BUILDING SITEWORK			
Landscaping	Formal	Yes	Little

- * Consistent with use.
- ** Increase for special areas.
- *** Consistent with security mandates.

Acoustic Requirements: Activity spaces shall be designed with the minimum noise levels consistent with good design practice. Using the Space Classes defined by the *General Services Administration*, provide the following design levels:

Description	Max. Ambient Noise Level	Partition Sound Isolation	Ceiling NRCs	Door Gasket
Class A Spaces: Areas that are noise sensitive, such as Hearing or Committee Rooms.	Special consideration by acoustical specialists.			
Class B1 Spaces: Areas where meetings take place on a frequent basis, such as conference and training rooms.	NC 30	STC 45	NRC 55 (Carpeted) or NRC 65	Yes
Class B2 Spaces: Areas where people are likely to speak in higher than conversational levels, such as dining rooms, cafeterias, copier rooms, etc.	NC 40	STC 45	NRC 55 (Carpeted) or NRC 65	Yes

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Class C1 Spaces: General office areas.	NC 35	STC 40	NRC 55 (Carpeted) or NRC 65	No
Class C2 Spaces: Open plan office areas.	NC 35	STC 20	NRC 55 (Carpeted) or NRC 65	No
Class D Spaces: Areas where speech privacy is not a concern, such as corridors, stairs, etc.	NC 35	N.A.	N.A.	No
Class E Spaces: Support spaces such as lobbies, toilets, and locker rooms.	NC 40	Separate from quiet areas.	N.A.	No
Class F Spaces: Warehouses, parking garages, fire stairs, etc.	<NC 50	Separate from quiet areas.	N.A.	No
Class X Spaces: Areas where inherently noisy activities are located, such as kitchens; mechanical, electrical, and communications equipment rooms; elevator machine rooms; and trash rooms.	Treat if NC exceeds 60	STC 45	N.A.	Yes

RESTRICTIONS

- Individual building programs may override any or all general requirements stated herein.

RELATED DOCUMENTS

- Not applicable.

AGENCY CONTACT - Mr. Bruce Arthur - (202) 225-5900.

0003 - SPATIAL DESIGN REQUIREMENTS

DESIGN REQUIREMENTS

Entrances, Vestibules & Lobbies: The main lobby should provide information facilities, waiting areas, and easy access to vertical transportation. While the main lobby should provide for formal reception of visitors and staff, it must also be planned to accommodate security stations, screening equipment, and the queuing space associated with security processing. The *Project Program* will detail the number of screening devices required for each project. Secondary entrance requirements are project dependent. The number of entrances staffed by security personnel should be held to the lowest number possible.

- **Physical Security:** Provide proper electrical service, empty conduit for Government-installed communication/security equipment, and floor load capacity to accommodate required equipment. Coordinate equipment layout with egress requirements.
- **Accessibility Provisions:** See Section 0101, Regulatory Requirements. The AOC requires full compliance with the *Americans with Disabilities Act* (ADAAG) and the *Uniform Federal Accessibility Standards* (UFAS), "Uniform Federal Accessibility Standards," *Federal Register*, 1985-494-187 (U.S. Government Printing Office).

Public Corridors: Irrespective of Code requirements, do not design corridors of less than 60" minimum width to allow for egress, mail and cleaning carts, and furniture relocations. Provide plaster wall surfaces for most public corridors in Principal and Support Buildings. If gypsum drywall is used as a finish in public corridors, it shall be at least 5/8" thick. Further, care should be given to provide finishes that are easy to maintain.

Toilet Spaces: Provide at least one public men's and one women's toilet room on every floor. On floors with cafeterias or snack bars, provide at least one men's and one women's toilet adjacent to the cafeteria or snack bar entrance. All public and common-use toilet facilities shall be accessible to persons with disabilities and other toilet facilities shall be convertible. All entries to public toilets shall maintain positive obstruction of lines of sight from without. Calculate all occupancies based on a population that is distributed 50% women and 50% men. Provide fixture counts in conformance with the *International Plumbing Code* using a population calculated at one person per 150 sq.ft. gross.

- **Toilet Partitions:** Provide ceiling-hung, enameled steel toilet partitions and urinal screens. Plastic laminate toilet partitions are not permitted. As required to match existing construction, marble and/or stained hardwood may also be utilized.
- **Toilet Accessories:** Unless otherwise authorized, provide stainless steel toilet accessories.
- **Finishes:** Provide a minimum of cementitious backer board behind all tile surfaces. The use of MR gypsum board will not be accepted.
- **Fixtures:** Provide continuous vanities of stone, artificial stone, or plastic laminate at all lavatories. Shield all piping in conformance with ADA requirements.

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Staff Lockers: In required locker spaces, provide vented lockers at the rate of one locker per employee with sufficient seating provided to permit all locker users to be seated at any time. Associated showers shall be in separate areas from the locker rooms. Provide finishes similar to those provided for toilet rooms.

Service Spaces: Provide custodial closets at a rate of not less than one janitor's closet for every 15,000 sq.ft. of occupied space or not less than one per floor. Provide lighting for safe access and egress during power outages. [Provide security locksets for service spaces in conformance with AOC standards. In addition:](#)

- **Electrical Closets:** Provide not less than one electrical closet for every 20,000 sq.ft. or a minimum of one per floor.
- **Communications Closets:** Provide not less than one communication closet for every 20,000 sq.ft. or a minimum of one per floor.
- **Janitor's Closets:** Wherever possible, locate janitor's closets proximate to toilet rooms.
- [Mechanical Areas: When mechanical rooms are located over occupied spaces, special attention shall be given to noise and vibration attenuation, provision of enhanced water-proofing, and access.](#)

Elevators: Provide elevators complying with ANSI A17 and ADA requirements in all multi-story buildings. Group multiple elevators in banks. Separate opposing banks in common groups with lobby areas not less than 10' wide. In general, provide elevators located to ensure that the travel distance from any occupied space is less than 200'. See Section D1010.

- **Wheelchair Lifts:** Do not use wheelchair lifts in new construction.

Loading Docks: Provide loading docks in conformance with the building program. Design dock heights at 45" and provide at least one dock bay with a powered dock leveler. Provide coiling overhead doors at each dock. Loading berths shall be provided only if specified in the approved building program. Staging areas shall be located adjacent to all loading docks and berths.

Security/Fire Control Centers: See 0005, Fire Protection Precepts.

RESTRICTIONS

- Section 0101, Regulatory Requirements.

RELATED DOCUMENTS

- Not applicable.

AGENCY CONTACT - Mr. Bruce Arthur, Director Architecture Division, or Mr. John Weber, Director, Technical Support Division, - (202) 225-5900.

0004 - MAINTENANCE PRECEPTS

DESIGN REQUIREMENTS

Service: Equipment shall be located with manufacturer-recommended clearance to adjacent walls, piping, and other equipment for maintenance and servicing. This includes removal of coils in domestic water heaters, converters, heat exchangers, etc. *State Dept*

- | • **Service:** Provide raised maintenance platforms for elevated equipment requiring regular servicing.

Replacement: Clearances shall be adequate to remove and replace equipment. Such replacement activities shall consider the entire access path within either new or existing buildings when equipment is designed or specified. *State Dept*

- **Service Access:** Provide minimum of 6' x 7' double-leaf doors to electrical and mechanical rooms. Ensure that access to electrical and mechanical rooms within finished construction will permit passage of replacement equipment from delivery points to installation areas. Size access doors larger than the minimum sizes listed if shipping sizes of replacement equipment so requires. Locate mechanical rooms at grade or on floors serviced by freight elevators.
- **Access Doors:** Provide access doors of 24" x 48" minimum clear opening, equipped with a minimum of 6-pin mortised deadbolt locks and flush mounting. For secure areas consult the AOC.

Replacement Parts: Equipment components shall be sized and selected such that a minimum of different unit sizes are required to minimize stocking of replacement equipment and parts where feasible. Further, wherever practicable, equipment shall be selected from standard catalogued products of manufacturers regularly engaged in the production of such products and that are the manufacturer's latest standard design that complies with the project requirements. Equipment shall essentially duplicate items that have been in satisfactory commercial and industrial use for at least two years, or more as appropriate. Provide standard, domestically produced products for which the manufacturer has published assurances that the products and their parts are likely to be available to the Government at a later date.

- **Note:** Extra stock and replacement parts may not normally be purchased under construction contracts.

Electrical & Mechanical Rooms: Design electrical and mechanical rooms for adequate access to equipment for proper operation and with clearances to preclude staff having to climb over or crawl under equipment for access or operation/maintenance. Equipment layout shall not require staff to stand or climb over any piece of equipment to service another.

- **Service Sinks:** Provide service sinks with hose attachments within all mechanical rooms.
- **Floor Drains:** Provide floor drains adjacent to all chillers, pumps, and air-handling units. To prevent flooding, ensure positive slope to floor drains without the use of secondary floor toppings.

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- **Lighting:** Position light fixtures in high ceilings in locations that allow re-lamping without the need for temporary scaffolding or the use of mechanical lifts. [Connect lighting to emergency power circuits.](#)
- **Receptacles:** Provide a minimum of one receptacle [per 1,000 square foot area connected to emergency power circuit and so identified.](#) All mechanical room receptacles shall be GFCI.
- **Telecomm Port:** Provide one telecomm port and proximate duplex receptacle in each electrical/mechanical room to support laptop computer use.

RESTRICTIONS

- Do not include “Extra Stock” in specifications.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 15050, Basic Mechanical Materials and Methods. (Future)*
- *AOC Guide Specification - Section 16050, Basic Electrical Materials and Methods. (Future)*

AGENCY CONTACT - Mr. Rick Khan, PE - (202) 226-6634 and Ms. Annette Kim, PE - (202) 226-3471.

0005 - FIRE PROTECTION PRECEPTS

DESIGN REQUIREMENTS

General: Comply with requirements of the [adopted Codes](#) as referenced herein. Design facilities to reduce the likelihood of fires and to mitigate their effects if encountered. Design facilities to protect human life, to reduce the potential loss to property and historic treasures, and to maintain continuity of Government function.

- ***Sprinklered Buildings:*** Unless specifically directed otherwise in writing, design all new Capitol Complex buildings for full sprinkler coverage. [Existing buildings shall be considered “protected throughout with an automatic, fully supervised sprinkler system” if the sprinkler system is currently under design, awaiting funding, or under construction. Associate A/E shall contact the AOC Project Manager to determine the building’s status. Note: Unprotected atriums that are 55 feet or higher do not negate “protected throughout” status.](#)
- ***Applicability:*** Unless specifically directed otherwise, the technical fire protection requirements of the AOC Design Standards apply to all new construction and to all renovation projects. Deviations from these requirements will be considered when the Associate A/E’s registered fire protection engineer performs a risk assessment of an alternative design and [submits the assessment to the AOC PM](#) to obtain the approval of the AOC Fire Marshall of equivalencies proposed in the assessment. Alternative designs shall provide equivalent or superior fire protection to that required herein.

Occupancy Classifications: Comply with occupancy classifications as defined in the Building Code.

Interior Finishes: Interior finishes for walls, ceilings, floors, draperies, curtains, and movable partitions shall meet the requirements of the Building Code. GSA

Emergency Power, Lighting and Exit Signage: Provide in accordance with the requirements of NFPA 101, Life Safety Code, and NFPA 111, *Standard on Stored Electrical Energy Emergency & Standby Power Systems*, 1996 Edition.

Fire Safety During Construction: A large portion of construction work performed within the Capitol Complex involves work within occupied buildings. Accordingly, require compliance with Building Code requirements and NFPA 241, *Safeguarding Construction, Alteration, and Demolition Operations* during construction operations.

- ***Construction Zoning/Phasing:*** Provide phasing drawings for projects affecting existing fire protection systems to provide for code-compliant coverage of spaces during construction. Delineate temporary fire partitions and paths of egress to be used during construction operations. Submit plans to the AOC for approval. Specifications shall provide provisions to ensure proper monitoring of space during times when permanent systems are out of operation.

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Renovation Projects: Retention and reuse of existing mechanical systems, life safety systems, or security equipment shall be subject to approval of the AOC.

RESTRICTIONS

- Do not contact local District of Columbia agencies for approvals/permits without prior written approval of the AOC. (Note: Some leased facilities and properties off of the Capitol Complex are subject to District of Columbia regulations).
- Facilities in the [District of Columbia, the State of Maryland, and the Commonwealth of Virginia](#) are subject to varying state and local codes and military regulations. Verify coverage of codes and regulations before commencing work.

RELATED DOCUMENTS

- Additional sections contained herein.

AGENCY CONTACT - Mr. John Williams, PE - (202) 226-2645

0006 - HISTORIC PRESERVATION

DESIGN REQUIREMENTS

Preservation Philosophy: The primary goal of all preservation efforts in the Capitol and Congressional Office Buildings is to preserve the historic fabric, significance, and character and to interpret the history and evolution of these historic buildings while retaining as fully as possible the continued utility of this complex as a public workplace.

Preservation Principles:

- *Any intervention* should be the minimum necessary, and every effort should be made to ensure that an intervention retains as much historic fabric as possible and is as noninvasive, unobtrusive, and reversible as possible.
- *An intervention* should take into account the possible importance of preserving signs of wear, damage, former maintenance, and other historical and scientific evidence.
- *All work* (other than housekeeping and routine/cyclical maintenance) should be documented, any sequential evidence should be recorded, and any significant fabric or building material that is removed should be identified and preserved.
- *Restoration and rehabilitation projects* should be undertaken only after written reports have summarized all known evidence. The replacement of missing features should be substantiated by documentary and physical evidence.
- *Stabilization and physical investigation* should not damage the resource or require the removal of historic materials better preserved in place.

RESTRICTIONS

- *No building material*, component, equipment, or furnishing shall be removed or disposed of without the written approval of the AOC.
- *Do not* contact local District of Columbia agencies for approvals/permits without prior written approval of the AOC. (Note: Some leased facilities and properties off of the Capitol Complex are subject to District of Columbia regulations.)
- *Facilities in the District of Columbia, the State of Maryland, and the Commonwealth of Virginia may be* subject to varying state and local codes and military regulations. Verify coverage of codes and regulations before commencing work.

RELATED DOCUMENTS

- Additional sections contained herein.

AGENCY CONTACT - Mr. William C. Allen - (202) 226-4714

0007 - SUSTAINABLE DESIGN

DESIGN REQUIREMENTS

General: AOC projects have intrinsically practiced sustainable design tenants for most of the agency's existence due to the preservation inherent in our stewardship role. The historic fabric while being retained has served as the basis for evolving adaptive uses of the historic structures entrusted to the Architect's care. As such, a major "green design" component of conserving existing structural frames and envelopes has frequently been met. With these new standards, the agency begins a formal process to improve our practices in the broader aspects of sustainability.

Resource Conservation & Recovery Act: The Resource Conservation and Recovery Act of 1976 requires federal agencies to establish a percentage of recovered materials to be used in the performance of a contract and to ensure that the actual amounts used meet those established by the applicable contract specifications.

- ***Use of Recovered Materials:*** Consult the Environmental Protection Agency's (EPA) Comprehensive Procurement Guidelines (www.epa.gov/cpg) for information on products containing recycled materials. To the extent consistent with AOC building quality levels and expected long-life cycles, incorporate recycled materials in project designs. As appropriate to project requirements edit project specifications to require recovered materials percentages in the following products:

Product	Material	Percentage of Total Materials
Structural Fiberboards	Recovered materials	80-100
Laminated Paperboard	Post-consumer Paper	100
Rock Wool Insulation	Slag	75
Fiberglass Insulation	Glass Cullet	20-25
Perlite Composite Board Insulation	Post-consumer Paper	23
Dividers/Partitions	Steel	20-30
Plastic Signage Systems	Plastic	80-100
Floor Tiles (Commercial)	Plastic	90-100
Lay-In Ceiling Tiles	Recovered/recycled materials	60-75
Synthetic Carpet Cushion	Carpet Fabrication Scrap	100

- ***Demolition and Construction Waste Management:*** New and renovation alteration projects shall have specification provisions establishing requirements for management of demolition and construction waste. To the extent practicable, consideration should be given to salvaging materials and equipment used in performance of the work. Specification requirements should establish "target" recycling goals and require contractor certification of disposal of designated materials with approved recycling organizations. For projects utilizing "long-form" section formats base requirements on Section 01524 -

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Construction Waste Management. For projects utilizing the AOC Short-form Division One, extract applicable provisions from Section 01524 into the Short-form Division One. The AOC does not require submission of LEED letters for credit.

Green Buildings: AOC projects shall be designed to conserve energy resources, improve environmental performance, and to appropriately utilize materials. To the extent practicable projects shall adhere to Leadership in Energy and Environmental Design (LEED™) “Green Building” principles. Requirements for Associate A/E completion of LEED Rating system forms for specific projects will be designated within individual project Task Orders or Professional Services Contracts.

- **New Buildings:** Consistent with applicable security provisions and with restricted Capitol Complex urban sites, Associate A/E design of new buildings and facilities shall be designed to achieve a minimum of an LEED “Silver” rating. Design submissions for identified projects shall document required compliance using the LEED rating system but shall not require submission to the Green Building Council for formal certification.
- **Existing Buildings (Future):** The LEED-EB requirements currently in draft stage. The AOC will apply energy conservation provisions specified in later sections of the Design Standards and appropriate consideration of material usage and demolition and construction waste management practices until appropriate ratings become available.

RESTRICTIONS

- **No building material,** component, equipment or furnishing shall be removed or disposed of without the written approval of the AOC.

RELATED DOCUMENTS

- AOC Guide Specification - Section 01524, Construction Waste Management.
- Resource Conservation and Recovery Act of 1976 (42 U.S.C. 6962).
- United States Green Building Council - “*Green Building Rating System for New Construction & Major Renovation*,” (LEED™)
- United States Green Building Council - “*Green Building Rating System for Existing Buildings Operations and Upgrades*,” (LEED-EB™).

AGENCY CONTACT - The Architecture Division - (202) 225-5900.

0101 - REGULATORY REQUIREMENTS

DESIGN REQUIREMENTS

General: Design and construction projects executed for the Architect of the Capitol are bound by various building codes, regulations, and standards. The application of each is affected by the project's location and ownership, which can be categorized as follows:

- **Capitol Complex:** Federal property designated on the drawing "Map Showing Properties Under the Jurisdiction of the Architect of the Capitol." Generally these lands encompass areas on or contiguous to Capitol Hill and the properties located at the U.S. Botanic Garden Nursery at D.C. Village.
- Note that for facilities the AOC is both the Client's representative and the Code Official having jurisdiction over the project. Review comments provided by the AOC shall be considered mandatory.
- **Federal Properties off of the Capitol Complex:** AOC and Library of Congress facilities located on property at Ft. Meade, Maryland, and on such other property that may be acquired.
- **Non-federal, Leased Properties:** Space leased in facilities under private sector ownership.
- **Historic Buildings:** For purposes of code interpretation, the United States Capitol, the United States Supreme Court, the Thomas Jefferson Building, the Russell Senate Office Building, the Cannon House Office Building, the Longworth House Office Building, the John Adams Building, and the Dirksen Senate Office Building shall be considered "historic" buildings.

Building Codes: Unless specifically instructed otherwise, in writing by the AOC, it is AOC policy to comply with the following Codes and Standards:

- **Capitol Complex:** Facilities built on the Capitol Complex property are exempt from the enforcement of local building Codes. The facilities of the Congress are, by legislation, subject to certain labor and environmental regulations that are enforced by the District of Columbia. The Project Manager will clarify any questions concerning interpretation of OSHA and EPA regulations.
- **Building Code:** The International Building Code, 2003 Edition (except Chapter 10, Means of Egress).
 - *Existing Buildings:* The International Existing Building Code, 2003.
- **Electric Code:** The International Electric Code, 2003.
- **Life Safety (Egress Requirements):** "Safety to Life from Fire in Buildings and Structures," "Life Safety Code," (ANSI/NFPA 101, 2003 Edition).
- **Referenced NFPA Standards:** When referenced NFPA Standards in IBC 2003 and NFPA 101 (2003) conflict, the most recent code edition shall be utilized.

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- **Elevator Code:** American National Standards Institute (ASME/ANSI) Standard A17.1, Safety Code for Elevators, and Escalators, [2000 Edition](#), including addenda.
- **Mechanical Code:** [International Mechanical Code, 2003](#).
- **Plumbing:** [International Plumbing Code, 2003](#).
- **Federal Properties off of the Capitol Complex:** For projects located off of the Capitol Complex on federal property, [applicable codes shall be determined in coordination with the AOC Project Manager](#).
- **Non-federal, Leased Properties:** [Design and construction in leased facilities shall comply with the code requirements of the jurisdiction in which they are located. Enhancements to those codes required to comply with agency safety requirements or agency continuity of mission requirements will be provided in writing by the AOC on a project-specific basis as necessary.](#)
- **Permits:** Work in non-federal leased facilities may require obtaining local building permits. Ascertain Code coverage prior to commencing design. Verify requirements for water and sewer connections.

Regulations and Standards:

- **Provisions for Persons with Disabilities:** The AOC requires full compliance with the *Americans with Disabilities Act* (ADAAG) and the *Uniform Federal Accessibility Standards* (UFAS). “Uniform Federal Accessibility Standards,” 1985-494-187 (U.S. Government Printing Office). Consult AOC staff for interpretations with regard to renovation and alteration of existing historic facilities.
- **Energy Conservation:** Comply with the [International Energy Conservation Code, 2003](#) and ASHRAE Standard 90.1-[2001](#), “Energy Efficient Design of New Buildings Except Low-Rise Residential Buildings.”
- **Environmental and Health Regulations:** Reasonable effort has been made by the AOC to identify and quantify any installed regulated materials that may be present in the portions of existing buildings subject to alteration or renovation. Building or component demolition activities may impact regulated materials that were not accessible for testing by the AOC.
- **Hazardous Material Identification:** [Review existing asbestos and lead test results provided by the AOC. Perform additional testing for lead-based paint and asbestos-containing materials as necessary to determine the extent of hazardous materials to be encountered during the construction of the project. A certified inspector must be used to obtain the required number of bulk asbestos and/or lead-based paint samples in the areas affected by the project, and submit the samples to a certified laboratory for analysis. The asbestos samples must be analyzed using either polarized light microscopy \(PLM\) with dispersion staining \(EPA Method 600/R93-116\) or transmission electron microscopy \(TEM\) for non-friable organically bound bulk samples \(NY ELAP Method 198.4\). Provide a report that reflects both the reliance on past testing and the results of any additional analysis, and include quantities of the hazardous materials found.](#)
- **Waste Stream Samples:** [To address EPA regulatory concerns, take a representative sample of the waste stream to be generated and perform Toxicity Characteristic Leaching Procedure \(TCLP\) testing \(EPA Method 1311\) to determine if the lead/heavy metals in the wastes should be managed and disposed of as hazardous waste; or determine through appropriate calculations that the lead/heavy metal content cannot exceed the TCLP limit for hazardous waste.](#)

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- **Abatement:** Incorporate appropriate abatement, monitoring, and disposal procedures into the design documents.
- **Hidden Hazards:** Incorporate standard language related to hidden hazards (see AOC Division One).
- **OSHA:** The AOC is subject to most requirements under 29 CFR 1910 and 1926. All projects shall comply with all OSHA requirements unless specifically exempted in writing by the AOC. In addition, compliance with state or DC occupational safety and health regulations is required.
- **EPA:** The AOC is subject to most requirements under 40 CFR. All projects shall comply with all EPA requirements unless specifically exempted in writing by the AOC. All **publicly owned treatment works** (POTW) discharge restrictions shall be adequately addressed in design, construction, and operation activities. Required environmental permit and registration requirements associated with the project must be identified as part of the design work. In addition, compliance with state or District of Columbia environmental regulations is required. **Develop supporting data and calculations, and complete required forms and paperwork, for any equipment or operations that will require the AOC to obtain a registration, operating permit, or similar approval under federal, state, or local regulations. Examples include, but are not limited to, tank registrations, NPDES permits, air permits, etc. This documentation shall be submitted only to the AOC for necessary action.**
- **Sites Other Than the Capitol Complex:** Projects designed for sites other than those on the Capitol Complex, shall have all local and state environmental codes investigated and a summary prepared for AOC analysis.
- **Connections to Utilities:** Comply with the latest published regulations of the affected utility.
- **Streets and Highways:** Comply with latest edition District of Columbia Department of Highways and Traffic, Standard Specifications for Highways and Structures (DHSS), storm water management and erosion control, and any addenda issued thereto prior to bid opening date.
- **Food Service:** Designs shall comply with National Sanitation Foundation (NSF) standards. Projects involving food service will be reviewed by the AOC **Environmental Health Specialist**.
- **Metric Dimensioning:** Drawings and specifications for new buildings shall be prepared in accordance with the latest edition of the following standards:
 - *ASTM E 380:* Standard for Metric Practice.
 - *ASTM E 612:* Standard Practice for the Use of Metric (SI) Units in Building Design and Construction.
 - **“Soft Metric:”** Designs shall be conceived and documented in “soft” metric. That is, standard products shall be used for design and construction with their inch-pound measurements converted to metric equivalents. Notation and dimensioning shall be “hybrid” with both the traditional inch-pound and hard metric values indicated on drawings and in specifications. For new buildings, notation and dimensioning shall be metric with the equivalent inch-pound units shown in parenthesis. For projects involving existing buildings and facilities constructed using inch-pound units, the Metric units shall be shown in parenthesis.

FAR: The AOC observes most provisions of the Federal Acquisition Regulations (FAR). For purposes of design and procurement, the Associate A/E should consider FAR as being applicable unless specifically informed otherwise by the AOC.

RESTRICTIONS

- Do not contact local agencies for approvals/permits without prior written approval of the AOC.

RELATED DOCUMENTS

- AOC Guide Specification - Section 13081 - Asbestos Abatement Procedures.
- AOC Guide Specification - Section 13082 - Lead Abatement Procedures.
- AOC Guide Specification - Section 13083 - Exterior Lead Abatement.

AGENCY CONTACT - [For safety and environmental questions](#) - Mr. Larry Denicola - (202) 226-6176, [for Food Service AOC Environmental Health Specialist](#), Mr. Wesley Mills - 202-225-7993, & Mr. John Weber - (202) 225-5900.

0103 - TEMPORARY FACILITIES & CONTROLS

DESIGN REQUIREMENTS

Security Inspections: All deliveries must be inspected off site and placed under U.S. Capitol Police seal. The location of the inspection facility is: 40 P St. S.E. (the corner of Half St. and P St., S.E.), Washington, D.C.; contact phone number is 202-226-0905.

- **Hours of Operation:** 5:00 AM to 2:00 PM, Monday through Friday.
- **Required Data:** Provide letter to the United States Capitol Police, on company letterhead stationary accompanied by the signature of the owner, president, or manager. Letters shall be renewed three (3) times per year, by April 30, August 31, and December 31, and should contain the following information:

- Name of the Company
- Name of the drivers/employees requiring access.
- Social Security Number and Date of Birth for each driver/employee.
- Buildings to be accessed.
- Company contact Person and telephone number.
- Provide information to:

United States Capitol Police
Operations Division
119 D Street, N.E.
Washington, DC 20510-7218
FAX: (202) - 224-4505

- **Notification:** All Contractors shall notify the Architect a minimum of two (2) working days in advance of each delivery. In addition to the above information, provide the following information for each vehicle making a delivery:
 - **Vehicle description(s):** Make, model, year, color, and license numbers with State.

Access to Loading Docks: Contractor access to Congressional loading docks is limited to the times listed below unless special arrangements are made with the appropriate Superintendent and costs of manning the facility are reimbursed:

Jurisdiction	Hours Open	Contact #	Address
U. S. Capitol	5:00 AM to 2:00 PM	202-228-8800	North Barricade on Constitution Avenue, N.E., at Delaware Ave.

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Jurisdiction	Hours Open	Contact #	Address
Senate Office Bldgs.	7:00 AM to 3:30 PM	202-224-3668	Access via tunnel at D Street, N.E. adjacent to Police Headquarters
House Office Bldgs.	6:00 AM to 4:00 PM	202-225-4141	Delaware Avenue, S.W., at C Street, S.W.
Ford House Office Building	By Appointment	202-225-4141	Virginia Avenue, S.W. between 2 nd & 3 rd Streets, S.W.
Library of Congress	6:30 AM to 3:00 PM	202-707-9085	C Street, between First & Second Streets, SE, Washington DC 20540
Supreme Court	By Appointment	202-	
Botanic Garden	By Appointment	202-226-0672	Independence Avenue, SW at West Courtyard Gate
Power Plant		202-	E Street, S.E.

Police to Have Keys: Provide 2 sets of keys to the United States Capitol Police for all temporary facilities and locked cabinets within the construction compound or site. For projects in the United States Supreme Court, provide keys to the Marshall. For projects in the Library of Congress, provide keys to the Library of Congress Police.

AOC Construction Fence: Details for two versions of approved AOC construction fences are available in MicroStation DGN formats from the Technical Support Division. The Project Manager should determine the appropriate version to be used on the project. Projects off of the main Congressional/Judicial Complex should use standard chain link fencing whenever possible.

Construction Signage: All construction signage shall be subject to AOC approval. Directional signage shall be planned and coordinated with the AOC Project Manager. All planned routes and locations for signs shall be approved by the AOC Project Manager prior to preparation of any construction signage. Signage shall comply with the following:

- **Signing Materials:** District of Columbia, Department of Public Works, Standard Specifications for Highways and Structures, Section 823, Signing Materials and Federal Highway Administration Standard Alphabets referenced therein with the exception that materials for temporary guide sign panel faces may be 3/4" painted plywood in lieu of reflective sheeting. Colors shall comply with the Manual of Uniform Traffic Control Devices for Street and Highways.
- **Text:** Text height and wording shall be as approved by the AOC Project Manager.
- **Closed Sidewalks and Streets:** To the extent possible, construction activities should be planned so as to minimize disruption of existing sidewalks and streets. Any planned construction that will disrupt sidewalks and streets shall be identified early in the design process to facilitate proper coordination with and approval of planned pedestrian and vehicular routes with Congressional Authorities and local authorities having jurisdiction.
- **Project Sign:** (Future).

RESTRICTIONS

- Do not assume contractor access to any site or facility.
- Do not place any signs on the site without written AOC approval.

RELATED DOCUMENTS

- AOC Guide Specification - Division 1, GENERAL REQUIREMENTS (Short Form Specs - Minor & Standard Projects.)
- AOC Guide Specification - Section 01500, TEMPORARY FACILITIES AND CONTROLS (Major Projects.)
- AOC Standard Construction Fence Drawing - AOC01500.DGN (MicroStation format only.)
- *Standard Specifications for Highways and Structures, 1996, District of Columbia, Department of Public Works.*
- *Manual of Uniform Traffic Control Devices for Street and Highways (MUTCD), Federal Highway Administration (FHWA), 23 CFR, Part 655, Subpart F.*

AGENCY CONTACT - Mr. John R. Weber - (202) 225-5900.

PART A - SUBSTRUCTURE

A000	INTRODUCTION
A100	FOUNDATIONS
101	Standard Foundations
102	Special Foundations
103	Slabs on Grade
A200	BASEMENT CONSTRUCTION
201	Basement Excavation
202	Basement Walls

A000 - INTRODUCTION

DESIGN REQUIREMENTS

General: AOC facilities are designed for longer service lives than private sector buildings. Additionally, facilities in the Capitol Complex will typically be subject to multiple alterations during their lives and thus should have suitable allowances made for differing partition configurations wherever practicable. For Principal and Support buildings consider building code live loads to be minimums and adjust upward in conformance with program requirements.

- Comply with provisions of the Building Code and *Minimum Design Loads for Buildings and Other Structures*, ASCE-7, as published by the American Society of Civil Engineers.

Progressive Collapse: “The structure of the building must not be subject to progressive collapse. The failure of a beam or slab should not result in failure of the structural system below or in adjacent bays. In case of column failure, the damage should be limited to the bays supported by that column.” GSA

Drift: Limit lateral deflection of a building under a lateral load to $H/500$.

Corrosion Protection:

- *Protect* all structures subject to salt runoff from streets and parking surfaces against salt induced corrosion including splash zones of vertical surfaces.
- *Steel deck* shall have a galvanized coating of not less than G90.

RESTRICTIONS

- N.A.

RELATED DOCUMENTS

- **Aluminum Association:** *Specification for Aluminum Structures.*
- **American Concrete Institute:** *ACI 318, Building Code Requirements for Structural Concrete.*
- **American Concrete Institute:** *ACI 530/ASCE 5/TM 5, Building Code Requirements for Masonry Structures.*
- **American Forest & Paper Association:** *National Design Specification for Wood Construction.*
- **American Institute of Steel Construction:** *Load and Resistance Factor Design Specifications for Structural Steel Buildings.*
- **American Institute of Steel Construction:** *Load and Resistance Factor Design Specifications for Steel Hollow Structural Sections.*

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- ***American Institute of Steel Construction:*** *Load and Resistance Factor Design Specifications for Single-Angle Members.*
- ***American Welding Society:*** *Structural Welding Code.*
- ***Federal Emergency Management Agency (FEMA) document:*** *NEHRP (National Earthquake Hazards Reduction Program) Recommended Provisions for Seismic Regulations for New Buildings and Other Structures, Part 1 Provisions (FEMA-302A), and Part 2, Commentary (FEMA-303A).*
- ***Tri-Service Manual:*** *TM 5-1300, Structures to Resist the Effects of Accidental Explosions.*

AGENCY CONTACT - Mr. C. A. Stillions, PE - (202) 225-5900

A100 - FOUNDATIONS

DESIGN REQUIREMENTS

Protection of Adjoining Property: As AOC construction sites become increasingly restricted by existing adjoining facilities, both on and off the Capitol Complex, increased consideration must be devoted to protection of adjoining property and buildings. Do not disturb adjoining property or buildings.

- ***Footings Outside of Property Lines:*** While in many instances the streets adjoining AOC buildings are also under the jurisdiction of the AOC, footings shall not project beyond property lines.
- ***Sheeting, Shoring and Underpinning:*** Construction documents shall be prepared to clearly place responsibility for protection of “banks of excavation or adjoining buildings” with the construction contractor and not the Government. GSA

Ground Water Control: Design foundations for positive removal of hydrostatic loads without the use of pumping. Drain to approved storm sewer lines.

Buried Structures: Protect buried structures with membrane waterproofing.

Sprinkler Piping: Provide calculations for sprinkler line water pressures for piping that impacts foundations to verify the provision and sizing of thrust blocks.

RESTRICTIONS

- Do not drain ground water into sanitary systems.
-

RELATED DOCUMENTS

- N.A.

AGENCY CONTACT - Mr. C. A. Stillions - (202) 225-5900.

A103 - SLABS ON GRADE

DESIGN REQUIREMENTS

Concrete Slabs on Grade: Minimum Compressive Strength: 4,000 psi @ 28 days.

- **Welded Wire Mesh Reinforcement:** Provide flat mats only.
- **Reinforcement, bars or WWF:** Place not closer than 1 inch from the top surface of the slab.

Concrete Crack Control: Make provisions for crack control. Tool control joints whenever possible. "Employ the following methods, alone or in combination, according to the severity of the condition:" GSA

- Epoxy-coated reinforcing bars/WWF.
- Concrete surface sealers.
- Corrosion-inhibiting concrete additives.
- Tooling of control joints is preferred to saw cutting.
- "Micro silica concrete used in lieu of additives."
- Water/cement ratio limits.
- Curing methods.

Concrete Elements in Parking Structures: "Protect the concrete in parking structures or below building levels by using corrosion-inhibiting additives, epoxy-coated reinforcing bars must be used for the top bars of the concrete beam and slab construction and the stirrups of beams and spandrel beams." GSA Slope parking garage decks to the drainage system.

Super-Flat Floors: Consult the AOC for structural requirements for projects involving super-flat floors.

RESTRICTIONS

- Do not use vapor barriers/vapor retarders under slabs-on-grade in parking structures or under slabs exposed to weather.
- Saw-cutting of slabs-on-grade shall occur as the final step in the finishing operation. The delay between finishing and saw-cutting shall not exceed one hour.

RELATED DOCUMENTS

- "Practitioner's Guide to Slabs on Ground," ACI.
- "Slabs on Grade," ACI Committee E-703, Concrete Craftsman Series 1.

AGENCY CONTACT - Mr. C. A. Stillions - (202) 225-5900.

PART B - SHELL

B000 INTRODUCTION

B100 SUPERSTRUCTURE

101 Floor Construction - *Structural frames, interior supporting walls, decks, slabs & sheathing, ramps, vapor retarders & insulation, fireproofing & firestopping.*

102 Roof Construction - *Structural frames, interior supporting walls, decks, slabs, and sheathing, canopies, vapor retarders & insulation, fireproofing & firestopping.*

B200 EXTERIOR CLOSURE

201 Exterior Walls - *Exterior skin, wall construction, vapor barriers & insulation, parapets, louvers & grilles, balcony walls & railings, & soffits.*

202 Exterior Windows - *Standard windows, storefronts, glazed curtain walls, & special windows.*

203 Exterior Doors - *Entrance doors, utility, special use, & gates.*

B300 ROOFING

301 Roof Coverings - *Shingles & roofing tiles, membrane roofing, horizontal waterproofing, sheet metal roofing, flashing & sheet metal, roof specialities & accessories.*

302 Roof Openings - *Skylights & other roof openings.*

B000 - INTRODUCTION

DESIGN REQUIREMENTS

General: AOC structural design requirements have been derived from the General Services Administration's publication PBS-PQ100, *Chapter 4 - Structural Engineering*, and have been edited to suit the requirements of the Capitol Complex. Unless otherwise noted, text in quotation marks is derived from that publication.

- Show connection details or required reaction loads for all structural steel framing connections. Show elevations for top of beams and slabs, top and bottom of columns, and bottom of footings.

Standards for Structural Design: The standards listed below will be utilized by AOC structural design staff as the basis for design reviews and approvals. Any standard specifically referenced by the AOC Design Standards shall be considered mandatory.

- **American Concrete Institute:** *ACI Manual on Concrete Practice*.
- **American Institute of Steel Construction:** *Manual of Steel Construction*.
- **American Iron and Steel Institute:** *Cold-Formed Steel Design Manual*.
- **Aluminum Association:** *Aluminum Design Manual*.
- **Steel Deck Institute:** *Design Manual for Composite Decks, Form Decks and Roof Decks*.
- **American Institute of Timber Construction:** *Timber Construction Manual*.
- **American Society of Civil Engineers:** *Minimum Design Loads for Buildings and Other Structures*, ASCE 7.

Dead and Live Loads: Like other Federal agencies, the Architect of the Capitol designs and operates buildings for much longer time periods than do private sector owners. Buildings will be altered and modified many times over their lives. Accordingly, design structural systems for long-term flexibility. Utilize systems that can accommodate the ready cutting of new openings in floors and design loadings that allow repositioning of partitions and occupancies. Design areas with higher live loads to comply with Code requirements or the actual anticipated loads, whichever is greater. "Do not use live load reductions for (1) horizontal framing members, (2) transfer girders supporting columns, and (3) columns or walls supporting floor and roof." GSA

Steel Framing Systems: While both Load Resistance Factor Design (LRFD) and Allowable Stress Design (ASD) are acceptable for AOC buildings, LRFD is preferred. GSA

- **Cambered Composite Beams and Girders:** Cambered composite beams should be considered for beams longer than 30 feet. "The camber should equal the deflection calculated for the combined dead load of wet concrete, steel deck and steel beams. Superimposed dead and live loads should be excluded from the calculation." GSA

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- ***Unshored Composite Beams:*** “Where unshored construction is used, the additional dead load caused by the increased concrete thickness” required to level the slab must “be accounted for in the structural design and specification” and communicated to the builder. ^{GSA}

Concrete Framing Systems: Cast-In-Place systems are preferred to other concrete framing systems for AOC office facilities.

- ***Concrete Slab Finish Tolerances:*** Measure floor slab finishes in accordance with ASTM E1155 and comply with ACI 117, *Standard Specification for Tolerances for Concrete Construction and Materials*.

Stability and Serviceability Criteria: Building structure shall not be subject to progressive collapse.

- ***Drift:*** Lateral deflection of a building under lateral load shall be limited to $H/500$. “Wind induced motion and sway should be limited.” ^{GSA}
- ***Corrosion Protection:*** “Structures requiring protection include concrete foundations exposed to saline ground water, parking decks, bridges and pavements where deicing salts are used, and structures exposed to salt-laden air.” “Structural steel exposed to the elements must have a protective coating on all steel surfaces. Small isolated structural elements may have hot dipped, galvanized zinc coating or coal tar epoxy paint. Larger exposed steel structures, such as parking, should use a two-coat system consisting of an organic zinc-rich urethane or epoxy primer, shop applied over blast-cleaned surfaces followed by a field-applied finish coat.” ^{GSA}

RESTRICTIONS

- Restrict use of “shored composite beams” to locations where level floor construction is not critical.
- Do not use “traffic coatings” on parking decks without AOC approval.

RELATED DOCUMENTS

- N.A.

AGENCY CONTACT - Mr. C. A. Stillions - (202) 225-5900

B101 - FLOOR CONSTRUCTION

DESIGN REQUIREMENTS

Live Load Requirements: Because of the long service life of buildings and facilities designed for the Congress and the Supreme Court, functions will often change numerous times over the life of the building. To allow for these changes of use, irrespective of Code requirements, design floor systems to accommodate the following live loads:

- | | |
|--|-----------------------|
| • Office Areas: | 125 lbs/sq.ft. |
| • Corridors: | 150 lbs/sq.ft. |
| • Corridors within Suites: | Same as office areas. |
| • Assembly Areas: | 150 lbs/sq.ft. |
| • Loading Docks and Service Areas: | 200 lbs/sq.ft. |
| • Mechanical Systems Areas (exclusive of equipment): | 150 lbs/sq.ft. |
| • Raised Flooring (Access Flooring): | 250 lbs/sq.ft. |
| | 2,000 lb. point load. |

Concrete: “Make provisions for crack control and employ the following methods, alone or in combination , according to the severity of the condition:” GSA

- | | |
|--|---|
| • Epoxy-coated reinforcing bars/WWF. | • “Microsilica concrete used in lieu of additives.” |
| • Concrete surface sealers. | • Water/cement ratio limits. |
| • Corrosion-inhibiting concrete additives. | • Curing methods. |

RESTRICTIONS

- The maximum total floor deflection in any bay shall not exceed 1/240 times the longest bay dimension.
- Do not use wood framing in any Principal or Support facilities.

RELATED DOCUMENTS

- N.A.

AGENCY CONTACT - Mr. C. A. Stillions - (202) 225-5900

B1010 - FLOOR CONSTRUCTION FIREPROOFING

DESIGN REQUIREMENTS

General: Design fire ratings of structural members and floor slabs in compliance with the Building Code.

Fire Stopping: Provide fire stopping in all openings in floors and shaft enclosures to comply with Code requirements. Where openings exist between exterior wall construction and floor slabs, provide full fire stopping in a manner that does not require on-going monitoring of the installation.

Exposed Fireproofing: Do not expose fireproofing in public areas. Protect all fireproofing from exterior environmental conditions that would compromise its integrity.

Sprayed-On Fireproofing: Comply with GSA requirements for corrosion resistance and compressive strength as specified in AOC Guide Specification.

RESTRICTIONS

- Do not expose fireproofing to exterior elements.
- [Armor/protect fireproofed columns subject to vehicular traffic or equipment bumping.](#)

RELATED DOCUMENTS

- *AOC Guide Specification, Section 07811 - Sprayed Fire-Resistive Materials (Future)*
- *AOC Guide Specification, Section 07841 - Through-Penetration Firestop Systems (Future)*

AGENCY CONTACT - Mr. John Williams, PE - (202) 226-2645.

B102 - ROOF CONSTRUCTION

DESIGN REQUIREMENTS

New Construction: Design roof drainage slope into the structural system to facilitate positive water flow without requiring the use of tapered insulation. Low slope roofs are discouraged, if required provide a minimum slope of 1:48.

- **Design:** Design all roof systems with positive slope to drainage to prevent ponding. Locate drains away from column high points. Insulate all horizontal storm leader lines.
- **Minimum Live Load:** Design roofs for a minimum uniform roof live load of 30 psf.
- **Roof Fall Protection:** Design worker fall protection integral to roof design, preserve watertight integrity.

Replacement of Existing Roofs: To the extent possible, replace existing roof systems, especially those on Principal buildings with roofing systems that match existing construction.

- **Roof Details:** Consultants are cautioned that existing substructures and backing materials (such as wood forming members under copper roof purlins) may not match contemporary lumber sizes and profiles.
- **HazMat:** Investigate existing materials' composition for presence of asbestos-containing materials prior to commencing design. Budget models for replacement installations shall include total costs of hazmat mitigation and existing system removals.
- **Maintenance Loads:** Consideration shall be allowed for loads from staging and materials handling.

Roof Access: Provide stair access to roof areas wherever practicable, with access via "curbed," sheltered and weatherstripped doorways. Where roof hatches must be employed, use insulated, lockable factory-fabricated units that employ integral flashing. [Do not permit outside or grade access to roof areas.](#)

Roof Mounted Equipment: House roof-mounted equipment in penthouses. If minor pieces of roof-mounted equipment are required, allow adequate space under them to facilitate roof maintenance/replacement and for ready observation of roofing surfaces. Do not support equipment on the roofing system.

RESTRICTIONS

- Do not use dead level roofs and do not use insulation to achieve roof slopes.

RELATED DOCUMENTS

- AOC Cell Libraries - MC05100.CEL, *Structural Steel*, MC05200.CEL, *Steel Joists & Metal Deck*, MC05300.CEL

AGENCY CONTACT - Mr. C. A. Stillions - (202) 225-5900.

B201 - EXTERIOR WALLS

DESIGN REQUIREMENTS

General: Design for long life with minimum maintenance in materials consistent with the requirements below. Comply with the following standards:

- **Brick Masonry:** *Technical Notes on Brick Construction*, published by Brick Institute of America (BIA).
- **Exterior Limestone:** *Handbook on Indiana Limestone*, published by Indiana Limestone Institute of America.
- **Exterior Marble:** *Exterior Marble Used in Curtain or Panel Walls*, published by Marble Institute of America.
- **Architectural Precast Concrete:** *Architectural Precast Concrete*, published by Precast Concrete Institute (PCI).
- **Concrete Masonry Units:** As applicable *TEK Notes*, published by National Concrete Masonry Association (NCMA).

Principal Buildings: Stone, typically granite, marble, or limestone reflecting both the permanence and historic character of the United States Congress.

- **Domestic Stone:** Use domestically quarried stone. Unless otherwise stated, match existing where required.
- **Minimum U-Factors:** In conformance with specified codes.

Support Buildings: Low maintenance materials of life expectancies consistent with the design life of the facility. Domestic limestone, precast concrete, or brick masonry is typically utilized.

Service and Temporary Buildings: Low maintenance materials of life expectancies consistent with the design life of the facility.

Insulation: Use insulation that is inherently free of “wicking” and moisture absorption.

- **Rigid Insulation:** Extruded polystyrene, polyisocyanurate, or EPS, faced as applicable to the installation.
- **Fibrous Insulation:** Encapsulate all fiberglass or mineral fiber insulation in foil or plastic covers to limit employee exposure to air borne fibers.

Wall Anchorages: Exterior walls shall be anchored for out-of-plane forces at each diaphragm level with steel anchors or straps that are developed into the diaphragm. “Inserts in concrete should be attached to or hooked around reinforcing steel.” GSA

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- **Cladding Anchors:** Cladding components weighing more than 10 psf shall be anchored to the exterior wall framing at a spacing not exceeding 6 ft. o.c. Use slotted or oversized holes at cladding connections to permit movement parallel to the plane of the building skin. GSA

Parapets: There shall be no laterally unsupported, unreinforced masonry parapets or cornices above the highest anchorage level with height-to-thickness ratios greater than 2.5.

Moisture Control: In masonry or stone cavity walls ensure that moisture migration to weep holes is assured by use of verticillated foam “mortar droppings barriers.” Design all horizontal joints between panels, dissimilar materials, or horizontal working joints at shelf lintels and such to ensure positive drainage to the exterior without total dependence on sealants.

- **Joints:** Design all control, expansion, and joints adjoining doors and windows to naturally shed water without reliance on applied sealants.

Sealants: Utilize long-life sealants consistent with required expansion coefficients and materials being joined. Silicone and urethane sealants are preferred at stone and masonry joints maintained by the AOC.

RESTRICTIONS

- Do not use cellulose insulation in exterior masonry walls.
- Do not use oleo-resinous sealants on exterior surfaces.
- Do not build rain conductors into exterior masonry walls. Locate any required rain leaders in areas accessible to future maintenance or replacement without the need of removal of any stone or masonry walls.
- Do not use exterior insulation and finish systems or brick veneer on metal studs without AOC approval.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 03331, Cast-In-Place Architectural Concrete (Future),*
- *AOC Guide Specification - Section 03450, Plant-Cast Architectural Concrete (Future),*
- *AOC Guide Specification - Section 04810, Unit Masonry Assemblies (Future),*
- *AOC Guide Specification - Section 04860, Dimension Stone Cladding (Future),*
- *AOC Cell Library - MC04150.CEL, Masonry Accessories,*
- *AOC Cell Library - MC04200.CEL, Unit Masonry*

AGENCY CONTACT - Mr. Bruce Arthur - (202) 225-5900.

B2011.1 - EXTERIOR STONE

DESIGN REQUIREMENTS

General: Principal buildings will normally employ the use of monumental stone finishes. To the extent possible, all stone employed in building within the Capitol Complex shall be domestically quarried and finished.

Monumental Buildings: The following table lists the stone used on existing monumental buildings in the Capitol Complex. Verify each installation prior to attempting replacement or modification on any surface. Unless directed otherwise, match existing stone for renovations or additions to existing buildings.

Stone	Producer/Fabricator	Type	Location
United States Capitol			
Sandstone	Not available	Aquia Creek sandstone.	Original section Central West Front.
Marble	Lee Marble Lee, Massachusetts	Lee White Marble	House & Senate Extensions.
Marble	Tate, Georgia	White Cherokee	Connecting Corridors & East Front Extension.
Marble	Cockeysville, Maryland	White Marble	Monolithic fluted columns, House & Senate Extensions.
Granite	Stone Mountain, Georgia	Stone Mountain Granite	East Front Steps.
Granite	Barre, Vermont	Rocks of Ages Granite	Base Course and Senate Wing Steps.
Rayburn House Office Building			
Flagstone	J.G. Robinson, Inc.; Fort Washington, PA. & Johnston & Rhodes Bluestone Co., East Branch, NY.	Flagstone - Natural seam.	Steps and paving at Garden Pool, Center Court.
Marble	Georgia Marble Company Source - Tate Georgia	White Cherokee - Sand- Rubbed Finish	East & West Courts from points A- B, C-D
Marble	Vermont Marble Company Source - Proctor, Vermont	Florence - Sand-Rubbed Finish	East & West Courts from points A- B, C-D
Granite	Texas Granite Corporation Source - Granite Falls, Texas	Sunset Red - GA-2 - Mellogroove Finish	Portico No.1 - Main Forecourt Paving
Granite	Texas Granite Corporation Source - Granite Falls, Texas	Sunset Red - GA-2 - Thermal Finish	Portico No.1 - Diamond squares on portico floor

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Stone	Producer/Fabricator	Type	Location
Granite	Texas Granite Corporation Source - Granite Falls, Texas	Sunset Red - GA-2 - Mellotone Finish	Steps @ terraces 1,2, & 3; border stones on all terraces; Curbs @ planting areas along sidewalks and East & West courts.
Granite	Cold Springs Granite Source - Cold Springs, MN.	Oxford Gray - OX - Polished finish.	All window spandrels between 2nd & 3rd floors.
Granite	Swenson Granite Company Source - Concord, NH	Swenson Pink - GA - 6 cut finish.	Ext. walls from grade to & including water table extending into East & West courts at points A, B, C, and D where changes in marble contract occur.
Granite	Davidson Granite Company Middle Georgia Quarrying Co., Sparta, GA Source - Granite Hill, GA	Davidson Pink - GA - 6 cut finish.	Ext. walls from grade to & including water table extending into East & West courts at points A, B, C, and D where changes in marble contract occur.
Granite	Davidson Granite Company Middle Georgia Quarrying Co., Sparta, GA Source - Granite Hill, GA	Davidson Pink - GA - Natural Split.	All exterior "Polygonal" walls.
Granite	Providence Granite Co., Providence, R.I.; Grenco & Ellis, Frankfort, Maine; & Castellucci & Sons, Providence, R.I.	Somnes Sound - GA - 6- cut finish. Quarried at Mt. Desert, Maine	Dressed stone on all terrace walls, quoins & balustrades.
Granite	Rock of Ages Corporation, Barre, Vermont	Regal Grey - GA-1 - 6-cut finish.	Steps & approaches to West Court; steps, landings, & borders on Independence Ave. Forecourt.
Granite	Harris Granite Co. Source - Salisbury, NC	Caroline Pink - GA-3 - shot-rubbed finish.	All granite base, border, platforms, and planting area walls in Center Court.
Granite	Harris Granite Co. Source - Salisbury, NC	Caroline Pink - GA-3 - Thermal finish.	Diamond-shapes stones on Independence Avenue forecourt and Ground floor loggia.
Limestone	Heltonville Limestone Co., Heltonville, IN. & Indiana Limestone Co., Bedford, IN	Select Buff - Sand finish, quarried at Oolitic, IN.	All exterior walls in Center Court, and decorative urns.
Longworth House Office Building			
Granite	Woodbury Granite Company, Hardwick, Vermont Source - Mt. Desert, MA	Somnes Sound Granite	Base Courses & Terraces

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Stone	Producer/Fabricator	Type	Location
Limestone	Shawnee Stone Company, Bloomington, IN Source - Bloomington, IN	Buff	Court Facade
Marble	Georgia Marble Company, Atlanta, GA Source - Ball Grounds, GA	White	Building Facade
Sand Stone	R. B. Phelps Stone Co. Source - East Branch, NY	Natural Cleft	Terrace Flagging & Paving
Cannon House Office Building			
Granite	Source - North Jay, MA	North Jay	Base on C Street wall, Planter curb, areaway facing & coping.
Limestone	Source - Bloomington, IN	Buff	Courtyard facing.
Marble	Source - South Dover, NY	White	Independence Ave. & New Jersey Ave. facades.
Marble	Source - Ball Grounds, GA	White	C Street and 1 st Street facades
Hart Senate Office Building			
Granite	Vermont Marble Co., Proctor, VT Source - Marble Falls, TX	Diamond Pearl	Exterior pavers, planter walls & steps
Granite	Vermont Marble Co., Proctor, VT Source - Chelmsford, MA	Miscellaneous to match existing	Other granite
Marble	Vermont Marble Co., Proctor, VT Source - Danby, VT	Danby marble	Exterior walls
Limestone	Vermont Marble Co., Proctor, VT Source - Bedford, IN	Buff	Exterior walls
Dirksen Senate Office Building			
Granite	Fletcher Granite Co. Source - Chelmsford, MA	Chelmsford Gray - Rubbed	Rubbed base, planter facings, most wall facing & coping, & planter curbs.
Granite	Fletcher Granite Co. Source - Chelmsford, MA	Chelmsford White - Polished	Polished trim at entrances
Limestone	Source - Bedford	Standard Buff	Exterior facing on east wall & interior court.
Marble	Vermont Marble Co., Proctor, VT Source - Danby, VT	Imperial (Eureka Grade) Danby	Exterior building face on Constitution Ave., 1 st Street & C Street.

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Stone	Producer/Fabricator	Type	Location
Russell Senate Office Building			
Granite	Concord, New Hampshire	Concord Grey	Base Course steps.
Limestone	Bloomington, Indiana	Buff	Court Fronts
Marble	Vermont Marble Company Danby, Vermont	White Danby	Street Fronts and Terraces
Ford House Office Building			
Limestone			
United States Supreme Court			
Granite	----	Grey	Retaining walls and curbing.
Marble	Vermont Marble Company Danby, Vermont	Imperial Danby	Exterior of structure
Marble	Georgia Marble Company Tate, Georgia	White	Four inner courts.
Thomas Jefferson Building, Library of Congress			
Granite	Swenson Granite Company Concord, New Hampshire	Pink	Entrance steps, cheek walls and paving, building base course.
Granite	Existing reconditioned material.	Pink	Curbing at drives and sidewalks.
Marble	Georgia Marble Company, Tate, Georgia	White Cherokee	Exterior walls.
John Adams Building, Library of Congress			
Marble	North Carolina, Greensboro, N.C.	North Carolina Pink	
Marble	Georgia Marble Company, Tate, Georgia	White	
James Madison Memorial Building, Library of Congress			
Granite	Cold Springs Granite, Corp., Cold Springs, Minn.	Diamond Pink - Sand & thermal.	Paving, shear walls, and Main building.
Granite	Cold Springs Granite, Corp., Cold Springs, Minn. South Dakota	Dakota Mahogany Sand, polished, & thermal.	Spandrels, planters, durex pavers.
Granite	H.E. Fletcher Company, West Chelmsford, Mass.	Chelmsford Grey - 6 cut finish.	Curbing.
Marble	Georgia Marble Company Tate, Georgia	White Cherokee - Sand-rubbed finish.	Pavilion corners, pilasters, columns, fascia, penthouse coping, & canopy.
Marble	Vermont Marble Company, Proctor, Vermont. Danby, Vermont.	Danby "H" - Sand-rubbed finish.	Window wells and penthouse walls.

RESTRICTIONS

- Do not use ferrous metal anchors without AOC written approval.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 04400, Stone. (Future)*
- AOC Cell Library - MC04150.CEL, *Masonry Accessories.*

AGENCY CONTACT - Ms. Kara Schonberger - (202) 225-5900.

B2018 - EXTERIOR BALCONY WALLS AND RAILINGS

DESIGN REQUIREMENTS

Metals: Consistent with project budgets and the historic character of the Congressional Complex, the use of decorative bronze and stainless steel metals is encouraged for guardrails and railings. Where possible, utilize naturally “maintaining” finishes. Restrict the use of lacquered bright brass to internal spaces.

Stone Railings and Balustrades: Restrict to Principal buildings.

Applied Finishes: Avoid color anodized or applied finishes on surfaces subject to “hand contact.”

Drains: Provide “freeze-proof” drains for all enclosed pipe spaces to vent internal spaces.

Service Areas: Consistent with ADA requirements, utilize Schedule 40 pipe wherever possible, galvanized with appropriate primers and industrial enamel top coats. In exterior areas consider Type 304 stainless steel.

RESTRICTIONS

- **Do not use** colored anodized aluminum for railings.
- **Do not use** fluoropolymer coatings (high performance organic coatings) for guardrails or handrails without AOC approval.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 05521, Pipe and Tube Railings. (Future)*

AGENCY CONTACT - Architecture Division - (202) 225-5900.

B202 - EXTERIOR WINDOWS

DESIGN REQUIREMENTS

General: Provide insulated glass units in all exterior windows unless security requirements mandate other solutions. To the extent practicable, fabricate metal window frames using thermal-break construction.

- **Historic Windows:** Consistent with security directives for a given project, analyze rehabilitation of existing wood windows prior to replacement with new metal windows that match existing profiles.
- **Anchorage:** “Window frames should be positively anchored to resist lateral loads. Clearance and flexible mountings should be provided to permit thermal movement and minimize glass breakage in storms and earthquakes.” GSA

Standards for Window Design: The standards listed below will be used by AOC staff as the basis for design reviews and approvals.

- **American Architectural Manufacturers Association (AAMA/NWWDA):** *Standard 101/I.S.2-1997, Voluntary Standards for Aluminum, Vinyl (PVC), and Wood Windows and Glass Doors.*
- **National Association of Architectural Metal Manufacturers (NAAMM):** *Standard SW-1.*
- **Steel Window Institute:** *The Specifier’s Guide to Steel Windows.*

Principal Buildings: Provide aluminum or bronze frame construction with low maintenance finishes. Do not use painted frames. Typically the AOC would utilize Heavy Commercial (HC) or Architectural (AW) class windows for Principal buildings.

Service and Support Buildings: Commercial windows, consistent with design life.

- **Operability:** Provide operable windows wherever practicable in mechanical rooms, garage and maintenance spaces to allow for secondary ventilation.

Glazing: Glazing in exterior walls and individual panes over 16 sq. ft. in area, located up to a height of 10 ft. above an exterior walking surface shall be laminated annealed or heat strengthened safety glass that will remain in the frame when cracked.

Infiltration Values: Consistent with referenced standards.

Minimum R-Factors: Where not inconsistent with finished appearance or affected by adverse contrasts to adjoining glazed surfaces, utilize low emissivity coatings.

Security Glazing: As programmed for each project. Requirements will be provided under separate cover. Do not remove security window film from existing windows without written AOC approval.

RESTRICTIONS

- Do not use mirror glass without AOC approval.
- Do not use wood windows except for temporary construction or when required to replace historic windows.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 08510, Steel Windows (Future).*
- *AOC Guide Specification - Section 08515, Aluminum Windows (Future).*
- *AOC Guide Specification - Section 08550, Wood Windows (Future).*
- *AOC Guide Specification - Section 08582, Security Windows (Future).*

AGENCY CONTACT - Mr. Bruce Arthur - (202) 225-5900.

B203 - EXTERIOR DOORS

DESIGN REQUIREMENTS

Entrance Doors: Entrances and exterior door system fabricated of high durability, low maintenance materials and finishes. Do not use revolving doors at accessible entrances.

- **Principal Buildings:** Bronze, stainless steel, muntz metals, etc. are preferred over standard commercial storefront systems utilizing standard aluminum extrusions.
- **Support Buildings:** Commercial, medium-stile aluminum entrance/storefront systems with anodic finishes are acceptable if the entrances are covered.
- **Service Buildings:** Hollow metal systems, glazed appropriately for the security conditions required.
- **Removable Mullions:** Provide a minimum of one set of double doors with a keyed, removable mullion with a lock strike to facilitate equipment transport at any building without a loading dock.

Finishes: Natural or rubbed finishes as appropriate to substrates at hand. Use spar varnishes for existing wood doors. Coordinate finishes on historic openings with the AOC.

Assisted Openings: Use hydraulic or pneumatic systems. Limit the use of electrically assisted door operators to retrofit installation where access to pressurized air is impracticable.

Hollow Metal Doors: Based on traffic, use ANSI/SDI-100 Grade II, Heavy Duty or Grade III, Extra Heavy Duty doors for exterior installations. Use galvanized steel construction (minimum G-90), foamed cores, and 14 ga. galvanized steel frames. Brake face sheets to form and meet in joint on stile edges, weld and grind smooth. Perimeter locksets shall contain 7-pin tumblers.

Hardware: See C-102 for standard hardware types by building. Coordinate all exterior openings with United States Capitol Police, Physical Security Division.

- **Finishes:** Use stainless steel or non-ferrous metals for all exterior hardware. At historically sensitive locations, match existing finishes.
- **Exit Only Doors:** Consult the AOC for security provisions for exit only doors in un-supervised locations.

RESTRICTIONS

- Do not use electrically powered accessibility devices at exterior openings (except in retrofit applications).
- Do not use knock-down frames for exterior openings.
- Do not use revolving entrance doors without AOC permission.
- Do not use applied finishes or powder coatings without AOC authorization.
- Do not use anodized or lacquered finishes on hardware subject to constant "hand" traffic.

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RELATED DOCUMENTS

- *AOC Guide Specification - Section 08110, Steel Doors and Frames. (Future)*
- *AOC Guide Specification - Section 08114, Custom Steel Doors and Frames. (Future)*
- *AOC Guide Specification - Section 08410, Aluminum Entrances and Storefronts. (Future)*
- *AOC Cell Library - MC08100.CEL, Steel Doors and Frames.*
- *AOC Cell Library - MC08400.CEL, Storefront Systems (Generic - 1-3/4" x 4-1/2").*
- *AOC Cell Library - AC08400.CEL, Storefront Systems (selected Kawneer & Vistawall).*
- *AOC Cell Library - MC08470.CEL, Revolving Doors (Generic).*
- *AOC Cell Library - AC08470.CEL, Revolving Doors (selected Besam & Crane).*

AGENCY CONTACT - Architecture Division - (202) 225-5900.

B300 - ROOFING

DESIGN REQUIREMENTS

General: Design roofs for maximum life. Utilize high durability systems such as sheet copper, tile, glazed terra-cotta, and stone. If low slope roofs must be accommodated, use the best grades of membrane systems.

- **Slopes:** Where practical and consistent with design, avoid low slope and flat roofs.
- **Other Systems:** Coordinate with fall protection and telecommunications requirements.
- **Wind Rating:** Provide minimum roofing ratings of I-90 for Principal/Support buildings and I-60 for Service buildings.
- **Water Ponding:** Employ positive roof slopes and “crickets” to prevent ponding of water.
- **Parapeted Roofs:** Provide overflow scuppers for all roofs that employ parapets.

Standards for Roof Design: The standards listed below will be used by AOC staff as the basis for design reviews and approvals.

- **Copper Development Association (CDA):** *Copper in Architecture Design Handbook.*
- **National Roofing Contractors Association (NRCA):** *NRCA Roofing and Waterproofing Manual.*
- **Sheet Metal and Air Conditioning Contractors National Association (SMACNA):** *Architectural Sheet Metal Manual.*

Maintenance: Design systems for ready maintenance and observation. Avoid systems requiring “topping-off” (pitch-pockets), or “resealing” (sealant closed cap flashing or termination bars). Place any systems that require inspection in clear view, without requiring bending or stooping.

- **Expansion Joints:** Use metal covered expansion joints with elastomeric vapor barrier backup. Set units a minimum of 8" above roof surfaces and design in conformance with SMACNA or Copper Development Association standards.
- **Roof Walks:** On flat roofs, provide roof walk surfacing from roof access points to each piece of roof mounted equipment requiring maintenance. Provide surfacing adjacent to each equipment service point [and adjacent to roof perimeters/parapets to facilitate inspection.](#)

Replacement: Utilize designs for flashing and terminations that support ready replacement of systems without disturbing underlying substrates. Use “snap-flashings and reglets” rather than systems that require caps to be bent up or back during roofing replacements. Match appearance and finish of existing materials.

Non-Proprietary Systems: Wherever possible, utilize non-proprietary flashing and termination systems, especially coping and gravel-stop systems. For AOC buildings, custom extrusions and fittings will likely obsolesce out of vendor catalogs and will be impossible to replicate under future maintenance/replacement programs. Use proven SMACNA flashing and termination systems.

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Hazardous Materials: It is mandatory that existing roofs be surveyed for the presence of hazardous materials (principally asbestos and lead), prior to commencing any replacement design. [Coordinate access with AOC.](#)

Odors: Coordinate individual project designs with AOC staff to mitigate the use of odor-causing materials adjacent to occupied areas.

Existing Buildings with Lightning Protection System: If roof is being replaced and requires removal/reinstallation of existing lightning protection system, provide new UL certification and grounding tests.

Fall Protection: [Coordinate roofing system design with required fall protection provisions to ensure each system's integrity is not compromised.](#)

RESTRICTIONS

- Where possible, limit the use of membrane systems to service/support buildings or replacement work.
- Do not build storm leaders into permanent walls.
- Do not use pitch pockets - provide [clamped](#) metal or thermo-plastic hoods over all penetrations.
- Do not use flush mounted membrane or covered membrane expansion joints.
- Do not locate roof drains adjacent to columns or other “high” points that would preclude ready water flow to drain after “creep” or short term snow loading occurs within roof structure framing.
- Do not suspend ductwork, conduit, lighting fixtures, or ceiling systems from metal roof decks.

RELATED DOCUMENTS

- *B300 Series sections that follow.*

AGENCY CONTACT - Mr. John Weber - (202) 225-5900.

B3014 - MEMBRANE ROOFING

DESIGN REQUIREMENTS

General: Modified bituminous systems are the current system of choice within the Capitol Complex for low-slope roofing. Wherever practicable, built-up systems should be replaced with modified bitumen systems, when compatible with existing substrates and roof slopes.

- **Maintenance:** Locate any sealant surfaces or expansion joints in easy to observe places to facilitate on-going maintenance.

Principal and Support Buildings: As appropriate to roof substrates, new roofs and long-term replacement low-slope roofs should employ 2-ply styrene-butadiene-styrene (SBS) systems. Hot mop apply these systems and provide wearing membranes with UV-resisting mineral granules. Base flashings should also be mineral granule SBS sheets.

Service Buildings: Short-term replacement roofs may employ atactic-polypropylene (APP) torch-applied systems for facilities scheduled to be surplus or replaced within 10 years.

Preferred Insulation Systems: Consistent with roofing membranes, provide polyisocyanurate board insulation with homasote protection layer, perlite facers or fiberglass reinforced facers free of asbestos.

Roof Walks: Provide roof pads on access routes and adjoining roof mounted equipment that requires service or maintenance.

RESTRICTIONS

- Do not build storm leaders into permanent walls.
- Do not use pitch pockets - provide metal or thermo-plastic hoods over all penetrations.
- Avoid use of "bar anchored" membrane roofing systems. If EPDM systems are required because of fume or fire considerations, employ fully-adhered systems.
- Do not use ballasted systems without AOC permission.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 07551, APP-Modified Bituminous Membrane Roofing. (Future)*
- *AOC Guide Specification - Section 07552, SBS-Modified Bituminous Membrane Roofing. (Future)*
- [AOC Cell Library - MC07620.CEL, Flashings.](#)
- [AOC Cell Library - MC07720.CEL, Roof Accessories.](#)

AGENCY CONTACT - Mr. John Weber - (202) 225-5900.

B3016 - SHEET METAL ROOFING

DESIGN REQUIREMENTS

General: Sheet metal roofing utilized for Principal and Support buildings within the Capitol Complex is limited chiefly to copper standing seam, copper batten systems, and copper flat seamed systems. Systems are designed for maximum life expectancies.

Copper System Components: ASTM B 370, cold-rolled copper sheet, H00 temper:

- **Copper Sheet for Panels:** 20 oz./sq.ft.
- **Copper Batten Caps:** 20 oz./sq.ft. Note: Many existing batten profiles do not align with contemporary wood sizes. Consult with the AOC prior to modifying profiles.
- **Snow Guards:** Locate snow guards over any entrance bordering a sloped metal roof.

Service Facilities: Aluminum-coated steel sheets, pre-painted by the coil-coating process may be used for roofing systems of service/support facilities located off of the Capitol Complex. Coat with fluoropolymer 2 coat finish systems unless otherwise directed. Use field-seaming systems that utilize concealed fasteners.

Lead-Coated Copper: Limited to matching existing installations only.

RESTRICTIONS

- Do not use galvanized steel for any roofing or flashing installation without written approval of the AOC.
- Do not use aluminum flashing without written approval of the AOC.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 07610, Sheet Metal Roofing. (Future)*
- AOC Cell Library - MC07620.CEL, *Flashings*.
- AOC Cell Library - MC07720.CEL, *Roof Accessories*.

AGENCY CONTACT - Mr. John Weber - (202) 225-5900.

B3017 - FLASHING & SHEET METAL

DESIGN REQUIREMENTS

General: Principal buildings shall utilize copper or stainless steel wherever practicable. Design flashing for ready observation by maintenance personnel and for replacement without destruction of retaining components.

Design: Unless otherwise noted, comply with the current edition of the Sheet Metal and Air Conditioning Contractors National Association's (SMACNA) "Architectural Sheet Metal Manual."

- Design cap flashing for ready replacement in areas adjoining roof terminations. Do not design cap or step flashing that requires bending or folding to gain access to roof base courses during re-roofing operations.

RESTRICTIONS

- Do not use membrane expansion joint systems for roof applications.
- Avoid surface-applied reglets and termination bars except in renovation work.
- Do not use aluminum flashing in Principal or Support buildings.
- Do not use applied finishes on flashing without AOC approval.
- Do not use galvanized steel flashing of gutters.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 07620, Sheet Metal Flashing and Trim. (Future)*
- AOC Cell Library - MC07620.CEL, *Flashings*.
- AOC Cell Library - MC07720.CEL, *Roof Accessories*.

AGENCY CONTACT - Mr. John Weber - (202) 225-5900.

PART C - INTERIORS

C000 INTRODUCTION

C100 INTERIOR CONSTRUCTION

- 101 Interior Partitions - *Fixed, demountable, operable, windows, & glazed partitions.*
- 102 Interior Doors - *Swinging & entrance doors, sliding, fire-rated, & special use.*
- 103 Interior Specialties - *Compartments & cubicles, wall & corner guards, lockers, storage shelving, toilet & bath accessories, [interior signage](#), & other.*

C200 STAIRWAYS

- 201 Stair Construction - *Cast-in-place, pre-cast, & metal stairs.*
- 202 Stair Finishes - *Tile, terrazzo, stone, resilient & special flooring finishes, & railings.*

C300 INTERIOR FINISHES

- 301 Interior Wall Finishes - *Concrete, plaster, gypsum board tile, painting, & special finishes.*
- 302 Interior Floor Finishes - *Concrete, tile, terrazzo, wood, stone, resilient, & carpet finishes, & access flooring.*
- 303 Interior Ceiling Finishes - *Plaster, gypsum board, acoustical, painting & special coatings.*

C101 - INTERIOR PARTITIONS

DESIGN REQUIREMENTS

General: Comply with Gypsum Association standards for construction of drywall partition systems. Comply with finish levels specified ASTM C-840, *Specification for Application and Finishing of Gypsum Board*.

- **Structural Isolation:** Nonstructural, rigid partitions must be supported by the structure in such a way that they cannot inadvertently become load-carrying elements. Isolate masonry partitions from the structure of the floor above by a gap and restrain partitions tops from lateral movement by continuous or intermittent steel angles or by steel straps grouted into the wall. Isolate masonry walls from concrete columns by flexible joints. ^{GSA} Metal stud partitions do not require in-plane lateral isolation.

Gypsum Drywall Systems: Use galvanized steel studs and runners for all gypsum drywall partition framing. As a minimum, provide the following construction and finish levels:

Location	System	Finish	Trim
Member's Offices	Gypsum Plaster	Level 4	Embedded galv. trim
Staff Offices & Conf. Rooms	Single layer 1/2"	Level 3	Reveal or embedded galv. trim
Corridors and Lobbies	Single layer 5/8"	Level 4	Embedded galv. trim
Monumental/Formal	Double 5/8"	Level 5	Embedded galv. trim
Service or support areas	Single layer 5/8"	Level 3	Reveal or embedded galv. trim
Closets, concealed areas	Single layer 1/2"	Level 2	Reveal or embedded galv. trim

Outside Corners in Gypsum Drywall Construction: Galvanized steel for all standard partitions, stainless steel at wet areas. Limit the use of vinyl trim to curved applications.

Veneer Plaster Systems: Use USG Imperial Plaster, or an approved equal, on high traffic areas receiving veneer plaster systems.

Backer Board: Cementitious backer board behind all tile systems applied to steel stud framing systems and for all exterior soffit systems that are to receive stucco or plaster finishes.

RESTRICTIONS

- Do not use gypsum based or treated gypsum panels behind tile surfaces.
- Do not use wood framing in AOC partition systems.

AOC DESIGN STANDARDS
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- Do not use textured finishes for walls. Limit textured finishes to sand floated finishes for portland cement plaster exterior soffits.

RELATED DOCUMENTS

- *AOC Guide Specifications - Section 09210, Gypsum Plaster. (Future)*
- *AOC Guide Specifications - Section 09215, Gypsum Veneer Plaster. (Future)*
- *AOC Guide Specifications - Section 09260, Gypsum Board Assemblies. (Future)*
- *AOC Standard Details - Interior Partitions - AOC-C101.DGN (Future)*
- [AOC Cell Library - MC09250.CEL, Gypsum Drywall Systems.](#)

AGENCY CONTACT - Mr. John Weber - (202) 225-5900.

C102 - INTERIOR DOORS

DESIGN REQUIREMENTS

General: This Section includes interior doors and associated hardware requirements.

Standards for Door Design: The standards listed below will be used by AOC staff as the basis for design reviews and approvals:

- **Architectural Woodwork Institute (AWI):** *Architectural Woodwork Quality Standards*, 7th edition.
- **Door and Hardware Institute (DHI):** *DHI A115-W-95, Wood Door Hardware Standards*.
- **Hollow Metal Manufacturers Association (HMMA):** *HMMA 861, Guide Specifications for Commercial Hollow Metal Doors and Frames*.
- **Steel Door Institute (SDI):** *SDI 108-90, Recommended Selection and Usage Guide for Standard Steel Doors*.
- **Window & Door Manufacturers Association (WDMA):** *Standard I.S.4-99, Industry Standard for Wood Stile and Rail Doors, and Standard I.S.1-A-97, Architectural Wood Flush Doors*.

DOORS

Metal Doors & Frames: Provide 1- 3/4" doors for all applications in conformance with the following:

Door Usage	Grade	Door Construction	Frame
Entrances	Ext. H.D.	Seamless, hollow or comp. cores	Full welded
Permanent partitions	Heavy-duty	Seamless, hollow or comp. cores	Full welded
Fire Doors	By Code	By Code	Full welded
Short-term partitions	Standard	Full flush, hollow or comp. cores	Knock-down

Interior Storefronts: Retail/service areas may employ narrow-stile doors in aluminum storefront systems. For glazed areas that adjoin doors and extend to the floor, provide horizontal mullions at 36" AFF.

Wood Doors & Frames: Comply with AWI Standards. Match existing door profiles and construction in alteration and renovation work. Flush wood doors are permitted in new construction for Monumental projects.

- **Principal Buildings:** AWI Premium Quality.
- **Support Buildings, Public Areas:** AWI Premium Quality.
- **Support Buildings, Staff Areas:** AWI Custom Quality.
- **Service Buildings:** Use metal doors.

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Labeled Doors: Provide rated fire doors constructed in accordance with NFPA 80.

HARDWARE

General: In new construction, utilize lever handle design latchsets and locksets to the maximum extent practicable. Provide the following:

- **Suite, Monumental, and Corridor Doors:** Mortise 7-pin locksets and ball-bearing hinges.
- **Office and single user doors:** Cylindrical 7-pin locksets and plain bearing hinges.
- **Fire and Security doors:** By Code.
- **Closers:** Install interior door closers on the room side of the doors.
- **Historic Doors:** To the extent possible, match existing or recondition to original specifications.
- **Specifying:** Specify using standard BHMA , ANSI, or Federal Specification nomenclature.

Marking and Keyways: Mark all keys with “U.S. Government - Do Not Duplicate.” All keyways are restricted, U.S. Government. Wherever possible, specify removable cores for new work.

Building Specific Requirements: Provide the following building-specific locksets, cylinders, and finishes:

Building	Std. Locksets	Std. Cylinders	Std. Finish
U.S. Capitol	Variable	Variable	Variable
Cannon House Office Building	Corbin/Russwin	6-pin	US 10B
Longworth House Office Building	Corbin/Russwin	6-pin	US 10B
Rayburn House Office Building	Schlage	6-pin	Varies
Ford House Office Building	Corbin/Russwin	6-pin	US 26D
East & West Garages	Sargent	Schlage 6-pin	US 26D
Russell Senate Office Building	Schlage	Medeco	US 10B
Dirksen Senate Office Building	Schlage	Medeco	US 613
Hart Senate Office Building	Schlage	Medeco	US 612
Jefferson Building	Mixed mfrs.	Yale 7-pin	Varies
Adams Building	Chantrell*	Yale 7-pin	US 28
Madison Building	Yale	Yale 7-pin	Varies
U.S. Supreme Court	Corbin*	By Government	US 10B
Thurgood Marshall Building	N.A.	N.A.	N.A.
U.S. Capitol Police	Schlage	Medeco	US 612

* Historic unit lockset/latchsets by special order.

RESTRICTIONS

- Wherever possible, avoid applied finishes on surfaces subject to hand contact.
- Do not “steam strip” historic wood doors during refinishing operations.
- Do not use brand names except as provided above.
- Do not use plastic laminate-faced doors without written AOC direction.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 08110, Steel Doors and Frames. (Future)*
- *AOC Guide Specification - Section 08211, Flush Wood Doors. (Future)*
- *AOC Guide Specification - Section 08212, Stile and Rail Doors. (Future)*
- *AOC Guide Specification - Section 08710, Door Hardware. (Future)*
- AOC Cell Library - MC08100.CEL, *Steel Doors and Frames.*
- AOC Cell Library - MC08200.CEL, *Wood Panel Doors.*
- AOC Cell Library - MC08730.CEL, *Thresholds and Weatherstripping.*

AGENCY CONTACT - Mr. John Weber - (202) 225-5900.

C1032 - COMPARTMENTS & CUBICLES

DESIGN REQUIREMENTS

General: This Section includes ceiling hung steel, color-coated finish toilet compartments and screens; and marble floor mounted partitions and screens. Provide wall hung screens at urinals. Provide floor mounted pilasters in stalls for persons with physical disabilities.

- **Stall Size:** Provide 3 ft. o.c. partition spacing with a minimum stall depth of 60".
- **ADAAG Stalls:** Provide minimum stall size of 60" x 60" for stalls designated for use by persons with physical disabilities. Consult the AOC for instances in renovation work where existing conditions may indicate a problem.

Metal Toilet Compartments and Screens: Provide nominal 1 inch (25mm) thick sandwich construction partitions fabricated of baked-enamel coated steel sheet bonded to kraft honeycomb cores. In high traffic public areas, the use of stainless steel face sheets is permitted.

- **Facing Sheets:** Provide mill-phosphatized steel sheet that is leveled to stretcher-leveled flatness electrolytically zinc-coated steel sheet, ASTM A 591, Class C. of the following minimum thicknesses:
 - *Pilasters (Unbraced):* 0.0478 inch (1.2 mm).
 - *Panels and Screens:* 0.0359 inch (0.9 mm).
 - *Doors:* 0.0299 inch (0.75 mm).
 - *Tapping Reinforcement:* 0.0747 inch (1.9 mm).
- **Core Material for Metal-Faced Units:** Sound-deadening honeycomb of resin-impregnated kraft paper in thickness required to provide finished thickness of 1 inch (25 mm) minimum for doors, panels, and screens and 1-1/4 inches (32 mm) minimum for pilasters.
- **Pilaster Shoes and Sleeves (Caps):** ASTM A 666, Type 302 or 304 stainless steel, not less than 0.0312 inch (0.8 mm) thick and 3 inches (75 mm) high, finished to match hardware.
- **Color-Coated Finish:** Manufacturer's standard baked finish complying with coating manufacturer's written instructions for pretreatment, application, baking, and minimum dry film thickness. One color in each room as selected by Architect from manufacturer's full range of colors.
- **Ceiling-Hung Compartments:** Corrosion-resistant anchoring assemblies complete with threaded rods, lock washers, and leveling adjustment nuts at pilasters for connection to structural support above finished ceiling without transmitting load to finished ceiling. Provide sleeves (caps) at tops of pilasters to conceal anchorage. Provide structural details on drawings to ensure coordination.

Marble Partitions: Ceiling mounted construction in new facilities utilizing polished marble of minimum HA-16 hardness. Comply with details of Georgia Marble company unless otherwise noted.

- **Partitions:** 7/8 inch (21mm) nominal thickness.

- **Pilasters:** 1-1/4 inch (32mm) nominal thickness.
- **Doors:** 1 inch (25mm) thick veneered solid core wood doors.

Hardware and Accessories: Stainless steel design, heavy-duty operating hardware and accessories.

Stirrup Brackets: Stainless steel ear or U-brackets for attaching panels and screens to walls and pilasters.

RESTRICTIONS

- Do not use floor-mounted [metal](#) partitions in restrooms.
- Do not use phenolic solid core or plastic laminate faced partitions.
- Do not use HDPE partitions.
- Do not use wood, lead, or plastic plug type anchors to secure panels or pilasters.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 10155, Toilet Compartments. (Future)*
- *AOC Cell Library - MC10150, Compartments and Cubicles.*
- *AOC Standard Details - AOC-C1032, Marble Compartment Details.*

AGENCY CONTACT - Ms. Karen Olmsted - (202) 225-5900

C1037 - LOCKERS

DESIGN REQUIREMENTS

General: Generally provide enameled steel lockers, single tier, on 4" concrete bases. Where impractical to use concrete bases (such as in renovation projects or where the installation is temporary), use metal closed "zee" bases. Where possible, recess lockers into construction. Where not possible to recess lockers, provide continuous sloped tops.

- **Latches:** Provide recessed latches and lock hasps.
- **Shelves:** Provide hat shelves in all lockers.
- **Number plates:** Metal plates with 1/2" high numbers.

| **Member Lockers:** 12" wide x 21" deep x 60" high wood front.

Health Suites (Athletic) Lockers: 12" wide x 21" deep x 60" high enameled steel or wood front.

Police Lockers: For locker rooms and individual officer lockers, provide 18" wide x 24" deep x 72" high. Each locker to have closet style hanging rod.

Support Staff Lockers: For support staff, lockers associated with shops, and all other lockers not defined above, provide metal lockers 12" wide x 18" deep x 72" high. Each locker to have closet style hanging rod.

Benches: Standard 9-1/2" x 1-1/4" maple.

RESTRICTIONS

- Do not use open leg lockers or flat top lockers except in temporary installations.
- | • Do not use lockers fabricated from HDPE.

RELATED DOCUMENTS

- 10500 - *AOC Guide Specification, Lockers. (Future)*
- AOC Cell Library - MC10500.CEL, *Lockers.*

AGENCY CONTACT - Ms. Karen Olmsted - (202) 225-5900.

C1038 - TOILET ACCESSORIES

DESIGN REQUIREMENTS

General: Stainless steel, flush trim, min. 16 ga., without brand names or logos.

Paper Towel Dispensers: Recessed (where possible) or semi-recessed:

- *Public Restrooms:* 9" x 800 ft. roll dispensers.
- *Staff Restrooms:* 575 C-fold.
- *Private Restrooms:* 300 C-fold.

Combination Towel Dispenser/Waste Receptacle: Recessed (where possible) or semi-recessed:

- *Public Restrooms:* 9" x 800 ft. roll dispensers/ 16 gal. waste.
- *Staff Restrooms:* 575 C-fold/ 13 gal. waste.
- *Private Restrooms:* 300 C-fold/ 2 gal. waste.

Toilet Paper Dispensers: Roll-in-reserve with automatic refill, surface mounted to walls and partitions.

Soap Dispensers: Deck-mounted, liquid piston-and-spout type, 16-oz. concealed below lavatories, or 45-oz. stainless-steel dispenser mounted under countertops.

Trash Receptacles: Recessed or semi-recessed, 9 or 12/13 gals.

Sanitary Napkins: Recessed or semi-recessed dispensers, napkins and tampons, 25¢ operating costs. Compartment partition mounted disposal units.

Mirrors: Single 18" x 24" over wall-hung lavatories, continuous over counter mounted lavatories. Provide tilted mirror at accessible lavatories. Provide continuous [stainless steel](#) shelves under all mirrors.

Grab Bars: 1-1/4" stainless steel tubing.

RESTRICTIONS

- Do not use wall mounted soap dispensers.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 10800, Toilet Accessories (Future).*
- [AOC Cell Library - MC10800.CEL, Toilet Accessories.](#)
- [AOC Cell Library - MC10815.CEL, Grab-bars.](#)

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- [AOC Cell Library - MC10830.CEL](#), *Mirrors*.

AGENCY CONTACT - Ms. Karen Olmsted - (202) 225-5900.

C200 - STAIRWAYS

DESIGN REQUIREMENTS

General: Provide stair finishes that are durable, easy to clean and maintain, and consistent with the floor that they serve but applied in a manner that facilitates future removal. Floor finishes in open, monumental stairs adjoining lobbies should match the finishes of the areas that they adjoin.

Treads & Nosings: Design treads to comply with ADA requirements and to facilitate future maintenance or replacement of treads. Use resilient treads with non-slip nosings, free of tight dirt-trapping crevices (such as 1 mm high raised round or square disks) on all stair treads other than those made of stone.

- **Service Stairs:** Stairs at loading docks, in mechanical areas, and general service spaces should be sealed concrete with replaceable cast metal nosings shaped to an “eased” edge profile.

Railings: Run interior railings continuously if practicable to support ADA requirements. Space wall mounted railings to comply with Code requirements.

- **Materials:** Fabricate railings and handrails from wood, stainless steel, aluminum, galvanized steel, and as justified by installation brass or bronze.
- **Service Areas:** Fabricate railings in building service areas and exterior service locations exposed to weather of aluminum to reduce maintenance costs.

Electrical: Provide one duplex [GFCI](#) receptacle at each landing to facilitate cleaning and maintenance operations.

RESTRICTIONS

- Do not use wood railings in required egress stairs or in service or support stairs.
- Do not use ships ladders in mechanical rooms without written AOC approval.
- Do not use painted handrails.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 05511, Metal Stairs. (Future)*
- *AOC Guide Specification - Section 05721, Pipe and Tube Railings. (Future)*
- AOC Cell Library - MC05720, *Railings.*
- AOC Cell Library - MC05723, *Nosings.*

AGENCY CONTACT - Technical Support Division - Mr. John Weber - (202) 225-5900.

C301 - INTERIOR WALL FINISHES

DESIGN REQUIREMENTS

General: Provide finishes that are durable, easy to clean and maintain, but applied in a manner that facilitates future removal. Where possible, select colors or sources that will allow matching over the long term.

Flexibility: The design life of facilities under the jurisdiction of the AOC is measured in centuries. During the life of these buildings even such “hard” spaces as kitchens and restrooms will be renovated many times.

Durability: In formal buildings at high traffic entrances and corridors, the use of natural stone products is encouraged.

- **Restroom Walls:** 4-1/4" x 4-1/4" is the preferred wall finish for new public restrooms in Support or Service buildings. Avoid the use of smaller tiles because of maintenance costs.
 - *Historic Finishes:* Match existing marble finishes in designated restrooms in Principal buildings.
- **Corridor Finishes:** Use flat paint for finishing plaster and drywall surfaces in corridors and public areas. Flat finishes allow maintenance staff to “feather” touch-up coatings without having to carry re-coats to extremes of each wall panel.
- **CMU Coatings:** In service areas with concrete or concrete masonry unit substrates, use semi-gloss paints to minimize dust collection.
- **Wood Paneling:** As appropriate to formal rooms and Member/Justice offices, preferably finished using water-borne, satin varnishes.

RESTRICTIONS

- Do not use “splatter” type paint finishes.
- Do not use vinyl wall-coverings without written approval of the AOC.

RELATED DOCUMENTS

- AOC Guide Specification - Section 04530, Marble Restoration.
- AOC Guide Specification - Section 09751, Interior Stone Facing (Future).
- AOC Guide Specification - Section 09800, Special Coatings. (Future)
- AOC Guide Specification - Section 09900, Painting. (Future)

AGENCY CONTACT - Technical Support Division - Mr. John Weber - (202) 225-5900.

C3019 - INTERIOR WALL PAINTING

DESIGN REQUIREMENTS

This Section includes interior painting systems. [Historic paint analysis may be required for designated areas or projects.](#) For historic decorative finishes consult with the AOC Historian and obtain approval for processes to be used.

Concrete Masonry Units: Use one of the following systems over interior concrete masonry block units:

- ***Low-Luster, Acrylic-Enamel Finish:*** 2 finish coats over a block filler.

First and Second Coats: Low-luster (eggshell), acrylic-latex, interior enamel.

- ***Semigloss, Acrylic-Enamel Finish:*** 2 finish coats over a block filler.

First and Second Coats: Semigloss, acrylic-latex, interior enamel.

Gypsum Drywall:

- ***Low-Luster, Acrylic-Enamel Finish:*** 2 finish coats over a primer.

First and Second Coats: Low-luster (eggshell), acrylic-latex, interior enamel.

- ***Semigloss, Acrylic-Enamel Finish:*** 2 finish coats over a primer.

First and Second Coats: Semigloss, acrylic-latex, interior enamel.

Plaster:

- ***Low-Luster, Acrylic-Enamel Finish:*** 2 finish coats over alkali-resistant, alkyd- or latex-based, interior primer.

First and Second Coats: Low-luster (eggshell or satin), acrylic-latex, interior enamel.

Woodwork and Hardboard:

- ***Low-Luster, Acrylic-Enamel Finish:*** 2 finish coats over alkyd-based, interior wood primer a primer.

First and Second Coats: Low-luster (eggshell or satin), acrylic-latex, interior enamel.

- ***Semigloss, Acrylic-Enamel Finish:*** 2 finish coats over a alkyd-based, interior wood undercoater.

First and Second Coats: Semigloss, acrylic-latex, interior enamel.

- ***Full-Gloss, Acrylic-Enamel Finish:*** 2 finish coats over a alkyd-based, interior wood undercoater.

First and Second Coats: Full-gloss, acrylic-latex, interior enamel.

Stained Woodwork: Provide the following stained finishes over new, interior woodwork:

- ***Alkyd-Based, Satin-Varnish Finish:*** 2 finish coats of an alkyd-based, clear-satin varnish over a sealer coat and an alkyd-based, interior wood stain.

Filler Coat: Paste-wood filler.

Stain Coat: Alkyd-based, interior wood stain.

Sealer Coat: Clear sanding sealer.

First and Second Finish Coats: Alkyd-based or polyurethane varnish.

- ***Waterborne, Satin-Varnish Finish:*** 2 finish coats of a waterborne, clear-satin varnish over a sealer coat and a waterborne, interior wood stain (not for floor or desk surfaces):

Filler Coat: Paste-wood filler.

Stain Coat: Waterborne, interior wood stain.

Sealer Coat: Clear sanding sealer.

First and Second Finish Coats: Waterborne, varnish finish.

- ***Water-Based, Full-Gloss, Varnish Finish:*** 2 finish coats of a waterborne, clear, full-gloss varnish over a sealer coat and a interior wood stain (not for floor or desk surfaces):

Filler Coat: Paste-wood filler.

Stain Coat: Interior wood stain.

Sealer Coat: Clear sanding sealer.

First and Second Finish Coats: Waterborne finish.

Natural-Finish Woodwork: Provide the following natural finishes over new, interior woodwork:

- ***Alkyd-Based, Satin-Varnish Finish:*** 2 finish coats of an alkyd-based, clear-satin varnish over a sanding sealer. Provide wood filler on open-grain wood before applying first varnish coat.

Filler Coat: Paste-wood filler.

Sealer Coat: Clear sanding sealer.

First and Second Finish Coats: Alkyd-based or polyurethane varnish.

- ***Waterborne, Satin-Varnish Finish:*** 2 finish coats of a waterborne, clear-satin varnish over a sanding sealer.

Filler Coat: Paste-wood filler.

Sealer Coat: Clear sanding sealer.

First and Second Finish Coats: Waterborne, varnish finish.

Water-Based, Full-Gloss, Varnish Finish: 2 finish coats of a waterborne, clear, full-gloss varnish over a sealer coat.

Ferrous Metal: Provide the following finish systems over ferrous metal:

- ***Semigloss, Alkyd-Enamel Finish:*** One finish coat over an enamel undercoater and a primer.

Primer: Quick-drying, rust-inhibitive, alkyd-based or epoxy-metal primer.

Undercoat: Alkyd, interior enamel undercoat or semigloss, interior, alkyd-enamel finish coat.

Finish Coat: Odorless, semigloss, alkyd, interior enamel.

- ***Full-Gloss, Alkyd-Enamel Finish:*** 2 finish coats over an enamel undercoater and a primer.

Primer: Quick-drying, rust-inhibitive, alkyd-based or epoxy-metal primer.

Undercoat: Alkyd, interior enamel undercoat or full-gloss, interior, alkyd-enamel finish coat.

Finish Coat: Full-gloss, alkyd, interior enamel.

RESTRICTIONS

- Do not use acrylic latex topcoats on metal without AOC permission.
- Do not use clear urethane coatings on exterior surfaces.
- Do not use vinyl wall coverings in corridors or public areas without AOC permission.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 09900, Painting. (Future)*

AGENCY CONTACT - Mr. John Weber - (202) 225-5900. [For Historic finishes contact Mr. William Allen.](#)

C302 - INTERIOR FLOOR FINISHES

DESIGN REQUIREMENTS

General: Provide finishes that are durable, easy to clean and maintain, but applied in a manner that facilitates future removal. Where possible, select colors or sources that will allow matching over the long term.

Flexibility: The design life of facilities under the jurisdiction of the AOC is measured in centuries. During the life of these buildings even such “hard” spaces as kitchens will be renovated many times. Wherever possible install flooring using “thin-set” methods that will permit easy removal and replacement as needs change without damage to underlying strata.

Durability: In Principal and Support buildings at high traffic entrances and corridors, the use of natural stone products is encouraged. Avoid use of limestone, slate or bluestones for interior installations.

- **Entrances:** Develop entrance areas with grilles or grating systems to mitigate dirt and moisture migration. For Service buildings, plan for the use of floor mats integrated into flooring system.

Stone Floor Finishes: Use stone surfaces in high traffic, public areas. Use stone tile wherever high levels of cleaning or maintenance is required. Use domestically quarried stone tile unless written permission is obtained from the AOC.

- **Marble:** Consider marble for use where the building program dictates, such as for entry lobbies and vestibules, etc. For renovation or alteration projects, match existing unless otherwise directed.
- **Granite:** Consider granite for use where the building program dictates, such as for entry lobbies and vestibules, and for surfaces that may be subject to freeze/thaw action or foot traffic transfer of snow removal salts. Use of thermal finishes preferred at exterior openings exposed to “wet” foot traffic.
- **Setting Mortars:** Use either dry-set factory formulated portland cement mortar or latex portland cement mortars in thin set beds wherever possible. Limit colors to natural gray, or for limited installations, white or black.

Concrete Floor Finishes:

- **Garage & Parking Areas:** High-density concrete surfaces on pre-stressed structural systems. Broom finish, with fluid-applied silane concrete sealer required. Slope all garage floors a minimum of 1/4" per foot to drains.
- **Mechanical & Support Areas:** Steel trowel finish with applied urethane finish coatings formulated to resist chemicals germane to the area of installation.
 - **Janitor Closets:** 6" x 6" x 1/2" quarry tile or steel trowel finish with applied urethane coating.

Tile Floor Finishes: Use tile or stone surfaces in high traffic, public areas. Use tile wherever high levels of cleaning or maintenance is required. Use domestically produced tile unless written permission is obtained from the AOC.

- **Ceramic Tile:** Preferred floor finish in public restrooms and staff/private toilets. Use porcelain ceramic units for floors, preferably 12" x 12" x 1/4" or 3/8" nominal size.
- **Quarry Tile:** Minimum 1/2" nominal thickness, standard smooth-cut 6" x 6" natural clay colored preferred. Do not use "flamed edge" styles. Addition of abrasive grit coatings is encouraged in traffic areas where slip resistance is required. Preferred floor surface for kitchen floors.
- **Dimension Stone Tile:** Granite or marble tile, 3/8" x 12" x 12." Vary dimensions as required to match original installations. Use thermal finishes at entries and other areas exposed to water.
- **Setting Mortars:** Use either dry-set factory formulated portland cement mortar or latex portland cement mortars in thin set beds wherever possible. Limit colors to natural gray, or for limited installations, white or black.

Resilient Flooring: Due to the high traffic and long-term life of most Congressional buildings, the use of resilient flooring systems is limited to short-term installations, such as vending areas, workrooms, service support areas, or intra-suite use. Provide slip-resistant flooring where required by ADA regulations.

- **Floor Tile:** Vinyl composition tile (VCT), 1/8" gauge, ASTM F 1066, Class 2 - through pattern. All flooring shall comply with ASTM E 648, Critical Radiant Flux - Class 1.
- **Sheet Goods:** Sheet vinyl complying with ASTM F 1303, Type II, Grade 1, 0.080 minimum nominal overall gauge, 0.050 nominal wear layer.
- **Stair Treads:** Vinyl treads with integral nosing, non-slip pattern, free of dirt catching grooves or crevices.
- **Base:** 4" vinyl bull nose cove base is the agency standard, with pre-formed corners. Use straight base at carpeted areas.

Terrazzo Systems: Terrazzo floor systems separated from the structural slab by a sand cushion are preferred. Consult the AOC when a sand cushion system cannot be used.

Special Flooring: Consult the AOC prior to specifying marble chip or ceramic granule "seamless" flooring systems.

Raised Floors (Access Flooring): Use concrete-filled metal floor panels or concrete floor panels. Use stringer type systems for floors subject to cart travel. Unless directed otherwise, provide high pressure plastic laminate surfaces in computing areas and metal surfaces under office areas scheduled to receive carpet tiles. Limit use of heavy-duty bolted stringer systems.

RESTRICTIONS

- **Avoid use** of setting methods that require "dapped" slabs or thick bedding methods in areas that may be subject to future renovation.
- **Do not** use field proportioned setting mortar except in thick bed installations where long slopes to drain are required.

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- **Do not** use organic adhesives to set stone tile.
- **Do not** use solid color resilient floor tiles, especially black and white.
- **Do not** use water-based adhesives over “new” or on below grade concrete slabs.
- **Do not** employ “sanding” techniques to remove existing resilient flooring systems.
- **Do not** install new resilient flooring systems over existing resilient flooring systems.
- **Do not** use resilient or laminate products with printed “wood grains.”
- **Do not** use resilient systems with extensive seaming or grout lines.
- **Do not** use curing compounds or sealers on concrete slabs scheduled to receive applied finishes or tile.
- **Do not** use traffic coatings on new or existing garage floors without written AOC authorization.
- **Do not** use resilient tile in public restrooms.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 03300, Cast-In-Place Concrete. (Future)*
- *AOC Guide Specification - Section 09310, Ceramic Tile. (Future)*
- *AOC Guide Specification - Section 09651, Resilient Tile Flooring. (Future)*
- *AOC Guide Specification - Section 09652, Resilient Vinyl Floor Coverings. (Future)*
- *AOC Guide Specification - Section 09638, Stone Paving and Flooring. (Future)*
- AOC Cell Library - MC09300.CEL, *Tile.*
- AOC Cell Library - MC09650.CEL, *Resilient Flooring.*

AGENCY CONTACT - Technical Support Division - Mr. John Weber - (202) 225-5900.

C3021 - CONCRETE FLOOR FINISHES

DESIGN REQUIREMENTS

Mechanical & Support Areas: Steel trowel finish with applied urethane finish coatings formulated to resist chemicals germane to the area of installation.

- **Janitor Closets:** 6" x 6" x 1/2" quarry tile or steel trowel finish with applied urethane coating.

Garage & Parking Areas: High-density concrete surfaces on pre-stressed structural systems. Broom finish, with fluid-applied silane concrete sealer required. Slope all garage floors a minimum of 1/4" per foot to drains.

RESTRICTIONS

- Do not use curing compounds or sealers on concrete slabs scheduled to receive applied finishes or tile.
- Do not use traffic coatings on new or existing garage floors without written AOC authorization.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 03300, Cast-In-Place Concrete. (Future)*
- *AOC Guide Specification - Section 07180, Traffic Coatings. (Future)*

AGENCY CONTACT - Mr. C. A. Stillions - (202) 223-1898.

C3028 - CARPET FLOORING

DESIGN REQUIREMENTS

General: Building specific requirements will frequently preempt the requirements listed in the table below. Contact AOC Interior Design staff prior to finalizing any determination affecting carpet.

Construction: The use of broadloom carpets is restricted to fixed partition senior level offices and spaces noted below. Use carpet tiles for all areas with demountable or relocatable partitions. In special instances, axminster or Wilton custom patterned carpets are employed.

Color/Patterns: Except in private offices, formal reception areas, use patterns to mask spills and soiling. Formal areas may, upon approval, use solid colors with or without borders.

Installation: Except in senior level private offices and spaces noted below, install carpet by direct glue methods, using “strippable” adhesives.

Location	Construction ³	Install Method	Pile Type	Design	Face Weight
Member’s Private office	Broadloom	Padded	Cut	Option	42 oz.
Senior Staff Office	Broadloom ¹	Padded	Cut/Loop	Option	42 oz.
Staff Office	Broad/Tile ²	Direct Glue	Cut/Loop	Texture	22 oz.
Clerical Areas	Broad/Tile ²	Direct Glue	Loop	Pattern	22 oz.
Work Rooms/Support	Carpet Tiles	Direct Glue	Loop	Texture	22 oz.
Public Reception Areas	Carpet Tiles	Direct Glue	Loop	Texture	28 oz.
Committee/Hearing Rooms	Broadloom	Padded	Cut	Pattern	22 oz.
Formal Dining Rooms	Broadloom	Padded	Cut	Pattern	28 oz.
Cafeteria Dining	Carpet Tiles	Direct Glue	Loop	Pattern	28 oz.
Meeting & Instructional Areas	Carpet Tiles	Direct Glue	Loop	Pattern	22 oz.

- 1) Hart Building - Carpet tiles throughout except Senator’s Office is broadloom.
- 2) Staff option in most Congressional Offices.
- 3) Cannon and Rayburn Buildings - Choice of carpet tiles or broadloom. Longworth Building - Only Committee Rooms may use broadloom as most other areas employ under-carpet wiring systems.

Fiber: Fourth generation Nylon, multi-lobal is preferred. Listed fiber face weights in the table are minimums. All yarn shall be solution dyed (except for identified patterns).

RESTRICTIONS

- Do not use broadloom carpets or padded carpet in open plan spaces or areas with demountable partitions.
- Do not use dark, solid colors except with AOC approval.
- Do not use carpet in corridors subject to heavy traffic.
- Do not use carpet within 5 feet of vending machines.
- Do not use carpet in serving line areas of cafeterias.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 09680, Carpet. (Future)*
- *AOC Guide Specification - Section 09681, Carpet Tile. (Future)*
- *AOC Cell Library - MC09650.CEL, Resilient Flooring.*

AGENCY CONTACT - Ms. Adrienne Powers - (202) 225-5900

C303 - INTERIOR CEILING FINISHES

DESIGN REQUIREMENTS

General: Formal rooms should receive plaster ceilings consistent with the room's function. Other spaces scheduled to receive monolithic ceilings should employ traditional gypsum drywall systems. In general, provide the following:

Location	System *	Finish	Trim
Member's Offices	Gypsum Plaster	Level 4	Embedded galv. trim
Monumental/Formal	Gypsum Plaster	Level 5	Embedded galv. trim
Staff Offices & Conf. Rooms (Principal Buildings)	Single layer 1/2" or Acoustical Ceilings	Level 3	Reveal or embedded galv. trim
Staff Offices & Conf. Rooms (Support & Service Buildings)	Acoustical Ceilings	N.A.	N.A.
Open Plan Offices	Acoustical Ceilings	N.A.	N.A.
Corridors & Lobbies (Principal Buildings)	Single layer 5/8"	Level 4	Embedded galv. trim
Corridors & Lobbies (Support & Service Buildings)	Acoustical Ceilings	N.A.	N.A.
Service or support areas	Single layer 5/8" or Acoustical Ceilings	Level 3	Reveal or embedded galv. trim
Closets, concealed areas	Single layer 1/2"	Level 2	Reveal or embedded galv. trim

* *Finish materials for fire-rated ceiling assemblies shall be firecode (Type X) gypsum drywall or fire-rated acoustical tiles/panels with rated suspension systems.*

Gypsum Drywall Systems: Provide gypsum drywall ceilings in conformance with finish levels specified ASTM C-840, *Specification for Application and Finishing of Gypsum Board*.

- **Fastening:** Screw fasten all gypsum drywall to studs or runners.

Ceiling Suspension Systems: Ceiling suspension systems should be anchored to structural slabs or members above - do not anchor to ductwork or piping. Suspension hangers and wires shall anchor with toggle, molly bolts, self-drilling anchors, cast-in inserts, or bolts in expansion shields. "Suspended ceilings must be isolated from walls which extend above the ceiling to the building structure." GSA

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- **Wet Areas:** Use stainless steel hangers wires or straps for suspension systems for ceilings in areas subject to moisture penetration or condensation.

Acoustical Ceilings: The AOC generally utilizes suspended acoustical ceilings in staff offices, retail, or service/support areas. Maintenance and tile replaceability governs the selection of acoustical ceilings systems within the Capitol Complex. Because the AOC maintains so much area and our storage facilities are restricted, stocking and being able to track multiple ceiling tiles is difficult. Additionally, requirements to rapidly respond to requests for space modifications mandates that standard materials be available and “ready-to-go” without having to await custom orders or matching within specific manufacturers. Accordingly, please limit acoustical ceiling system options to those listed below.

- **Metal Suspension Systems:** Wide face 15/16" capped “TeeBar” or 9/16" slotted “TeeBar,” steel suspensions systems with electrolytically zinc coated finishes achieving a minimum Z90 coating.
- **Penetrations:** Center all ceiling penetrations within tile fields.
- **Hold-downs:** Use hold-downs adjacent to operable doors and windows.

Acoustical Panels: Provide either 24" x 24" x 5/8" or 24" x 48" x 5/8" module standard. Unless otherwise approved, provide standard square edge complying with ASTM E-1264. All tiles should be rated Class A (Flame spreads of 25 or less) under ASTM E-84. All acoustical panels shall be free of asbestos.

- **Standard Office Ceilings (Support Buildings):** Type III, Form 2, water felted, "fissured pattern" and “perforated small holes” face (Pattern C, D) tiles. Provide NRC rating of at least 0.60, CAC of 35, and light reflectances of 0.80 or better.
- **Kitchen and Servery Areas:** If suspended acoustical ceilings are used, provide Type IV, Form 2, wet-formed mineral fiber panels with polyester film surfaces and washable finishes. Provide NRC rating of 0.55, CAC of 35, and light reflectance of 0.80.
- **High-Traffic or Abuse areas:** If suspended acoustical ceilings are used, provide Type XX, Form 2, pattern C D surfaces Plain face, ceramic and mineral fiber composition with high-density ceramic-like finish and scrubbable finish. Provide NRC rating of 0.55, CAC of 40, and light reflectance of 0.80.

Linear Metal Systems: As approved on a case-by-case basis based on traffic and exposure conditions.

RESTRICTIONS

- Do not use concealed spline systems without prior authorization.
- Do not use tegular or reveal edge tiles, especially custom designs.
- Do not use narrow face or box-shaped suspension systems.
- Do not use patterned or scored face tiles (nodular or cast panels).
- Do not use suspended ceiling systems to achieve fire protection of structural components.
- Do not use suspended ceiling systems in shower rooms or other high humidity areas.
- Do not use fiberglass panels without written approval.
- Do not use powder-actuated fasteners to anchor ceilings.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 09210, Gypsum Plaster. (Future)*
- *AOC Guide Specification - Section 09260, Gypsum Board Assemblies. (Future)*
- *AOC Guide Specification - Section 09511, Acoustical Panel Ceilings. (Future)*
- *AOC Guide Specification - Section 09512, Acoustical Tile Ceilings. (Future)*
- *AOC Guide Specification - Section 09547, Linear Metal Ceilings. (Future)*
- *AOC Cell Library - MC09250.CEL, Gypsum Drywall Systems.*
- *AOC Cell Library - MC09500.CEL, Acoustical Ceilings.*

AGENCY CONTACT - Mr. John Weber - (202) 225-5900.

PART D - SERVICES

D000 INTRODUCTION

D100 CONVEYING SYSTEMS

- 101 Vertical Transportation Systems - *Dumbwaiters, elevators & escalators.*
- 102 Other Transportation Systems - *N.A.*
- 103 Other Conveying Systems - *Material handling systems, hoists & cranes, & scaffolding.*

D200 PLUMBING SYSTEMS

- Basic plumbing materials, methods and identification.*
- 201 Plumbing Fixtures - *Water closets, urinals, lavatories, sinks, etc.*
- 202 Domestic Water Distribution - *Supply piping systems, equipment, & supply insulation.*
- 203 Sanitary Waste Systems - *Waste & vent systems, plumbing specialties, equipment.*
- 204 Rain Water Drainage Systems - *Piping, specialties, & insulation.*

D300 HEATING, VENTILATING & AIR CONDITIONING

- Basic mechanical materials, methods, and identification.*
- 301 Fuel Supply Systems - *Oil, gas, coal & other supply systems.*
- 302 Heat Generation Systems - *Steam boilers, hot water boilers, & fuel-fired heaters*
- 303 Heat Rejection Systems - *Chillers, cooling towers, & compressors/ condensers, & heat pumps.*
- 304 Heat Distribution Systems - *Air, steam, & hydronic distribution, & exhaust systems.*
- 305 Heat Transfer - *Heat exchangers, air coils, humidifiers, & terminal transfer units.*
- 306 HVAC Controls & Instrumentation - *EMCS, HVAC control, & other.*

D400 FIRE PROTECTION SYSTEMS

- 401 Fire Protection Sprinkler Systems - *Wet & dry pipe, pre-action, combination & deluge.*
- 402 Standpipe & Hose Systems - *Standpipe & valves, hoses, & cabinets.*
- 403 Fire Protection Specialties - *Extinguishers, blankets, and cabinets.*

D500 ELECTRICAL SYSTEMS

- 501 Electrical Service & Distribution - *Transformers, switchboards, panelboards, breakers & control.*
- 502 Lighting & Branch Wiring - *Branch wiring, & interior lighting.*
- 503 Communications & Security Systems - *Alarm & detection, voice/data, P.A. & TV.*
- 504 Special Electrical Systems - *UPS, generators, electromagnetic shield. & lightning protection.*
- 505 Electrical Controls - *Electrical systems and lighting controls.*

D600 SPECIAL MECHANICAL SYSTEMS (Not Used)

D101 - VERTICAL TRANSPORTATION SYSTEMS

DESIGN REQUIREMENTS

General: All occupied areas of Capitol Complex buildings and facilities shall be served by at least two passenger elevators. Design all elevators to comply with ASME A17.1 and with UFAS/ADA Accessibility Guidelines.

- **Waiting Areas:** Provide sufficient lobby or corridor waiting space to allow passengers to wait for an elevator clear of the building traffic flow.
- **Mechanical Room Access:** Provide service or freight elevator access to serve the mechanical equipment floor or penthouse.
- **Freight Elevators:** Locate freight elevators remote from passenger elevator lobbies, of sufficient capacity to transport replacement parts for building systems, such as compressors, motors, fans, elevator hoist motors, and similar loads specified in the Building Program. GSA

Elevator Traffic Analysis: For Principal and Large Support buildings employ an independent consultant to determine the number and type of elevators to be employed. The traffic analysis shall determine the quantity, capacity, and speed requirements of the elevators. Absent formal program populations, calculate population at the rate of one person per every 150 sq.ft. of gross building area. Elevator waiting times shall not exceed 30 seconds during peak time periods in a typical bank. Passenger elevators shall have capacities between 2,500 and 3,500 pounds, with cars sized to ANSI A17.1 standards.

- **Peak Loads:** Assume that 10 percent of the population will not require service during the peak time frame. Calculate average interval as the time between departures of elevators from the main lobby during the a.m. peak period. Average intervals shall not exceed 30 seconds. Calculate handling capacity as the number of persons the elevator system must move in any given 5-minute period of up-peak traffic used to measure average interval. Design buildings for 16 percent handling capacity. GSA
- **Other Service:** Provide separate calculations for passenger and for freight or service (combination of passenger and freight) traffic. If the building provides parking levels, prepare a separate analysis for shuttle elevators connecting parking levels to the lobby.

RESTRICTIONS

- Do not use wheelchair lifts in new buildings.

RELATED DOCUMENTS

- N.A.

AGENCY CONTACT - Mr. Charles Aquilina - (202) 225-3988.

D1010 - ELEVATORS

DESIGN REQUIREMENTS

General: Design all elevators to comply with ASME A17.1 and with UFAS/ADA Accessibility Guidelines.

Elevator Types: The following types of elevator installation are permitted:

- ***Traction Elevators:*** Both geared and gearless, overhead and basement mounted machines for service to more than 4 stops. Geared machines may be used at speeds of 350 FPM or less. Use gearless machines for speeds of 500 FPM or greater.
- ***Hydraulic Elevators:*** For service to 4 stops or fewer, hydraulic elevators may be used. Systems may be hole or hole-less. Minimum speed shall be 100 FPM.

Elevator Sizes: Adjust elevator car sizes to comply with traffic analysis, but at a minimum, provide the following capacities:

- Traction passenger elevators shall have minimum capacities of 3,500 lbs.
- Hydraulic passenger elevators shall have minimum capacities of 2,500 lbs.
- Freight elevators shall have minimum capacities of 5,000 lbs.
- Service elevators shall have minimum capacities of 4,000 lbs.

Elevator Doors: Provide the following door configurations:

- ***Passenger Elevators:*** Center opening.
- ***Freight Elevators:*** Bi-parting.
- ***Service Elevators:*** Side-slide.

Car Designs: Provide removable wall panels in passenger and service elevators. Provide stainless steel wall panels in freight elevators. Use industry-standard platform sizes to facilitate future replacement for maintenance. If no separate freight/service elevator is provided, provide passenger elevators with minimum 8' ceilings. Recess lighting in freight elevators to preclude damage from equipment.

- ***Freight Elevators:*** Provide minimum ceiling height of 10 feet.
- ***Service Elevators:*** Provide minimum ceiling heights of 9 feet.

Controllers: Provide micro-processor controllers with monitoring capabilities.

Equipment Rooms: Design machine room to maintain a temperature range of between 60 to 85 deg. F and 45% to 75% RH. Do not locate HVAC equipment or condensate lines over control equipment. Provide at least one light fixture (minimum 2 lamps, equal wattage) on the emergency lighting circuit. Provide at least one **GFCI** duplex receptacle for service use on a circuit separate from that used for the control equipment.

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- **Equipment Room Access:** Design machine rooms to be accessible from public corridors without requiring travel through offices or restrooms.

Maintenance & Service Access: Provide trap doors, trolley beams, and hoist beams at elevator machine rooms for traction elevators where the machine room is not serviced by a freight or service elevator. ^{GSA} Provide a fixed pit ladder, fabricated from aluminum, with a light switch and dedicated **GFCI** duplex receptacle in each hoistway pit. Provide sump pumps as directed by the AOC.

RESTRICTIONS

- Do not use integral return panel car control stations.
- Do not connect pit sumps directly to sewers.

RELATED DOCUMENTS

- AOC Guide Specification - 14212, Modernization of Traction Elevators.
- *AOC Guide Specification - 14242, Modernization of Hydraulic Elevators. (Future)*
- AOC Guide Specification - 14420, Wheelchair Lifts.

AGENCY CONTACT - Mr. Charles Aquilina - (202) 225-3988.

D1011 - ESCALATORS

DESIGN REQUIREMENTS

General: Escalators shall be installed as supplements to elevators when vertical transportation is required for a large unpredictable volume of public traffic. They should be used where the first floor is not large enough to contain the high public traffic so that the interval for elevators can be calculated with accuracy. ^{GSA} Because of intendant maintenance costs, only use escalators when absolutely necessary. Escalators shall be centrally located, visible from the building entry/security station, and convenient to the areas that they serve.

Capacity: Calculate escalator capacity based on the following chart derived from the General Services Administration:

Escalator Width	Capacity in Persons per Hour	Capacity in Persons per 5 Minutes
32 inch	3,000	250
48 inch	4,000	400

RESTRICTIONS

- Do not use escalators in design solutions without AOC approval.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 14310, Escalators. (Future)*
- *AOC Guide Specification - Section 14311, Modernization of Escalators.*

AGENCY CONTACT - Mr. Charles Aquilina - (202) 225-3988.

D201 - PLUMBING FIXTURES

DESIGN REQUIREMENTS

General: Use water conserving designs complying with *Energy Policy Act* for all equipment.

- *Ensure* that fixtures are current designs.
- *Ensure* that fixtures facilitate cleaning and ease of maintenance.

Water Closets, Wall-Hung: Vitreous china, siphon jet, elongated bowls with 1-1/2" top spud, 1.5 gallon flush and electronic flush sensor. Equip private toilets with flushometers, public toilets with sensor activation.

- *Accessible units* - Use wall-hung units to facilitate wheelchair footrest clearance.

Lavatories: Public restrooms use counter-mounted, vitreous china, 19" x 15" bowl. Use minimum 17 ga. (1.1mm) plated-brass waste fittings on all units.

- *Lavatories, Private:* Cabinet or pedestal models as applicable to the design.
- *Service Sinks:* Wall-mounted sink designs preferred. Do not use floor basins without written approval.

Faucets: All metal construction with either conventional, commercial grade washer designs, or ceramic washer-less designs. Provide chrome-plated brass, "hands-free" sensor-type faucets driven from building power wherever practicable, with controlled temperatures. All units with individual cutoff valves and tubular plated-brass supply. Battery-powered sensors may be used on renovation projects upon AOC approval.

Floor Drains: Cast-iron bodies with polished nickel bronze 6" x 6" strainers, with deep seal traps. Where traps are likely to dry out, provide deep seal traps and primers.

Grease Traps: Provide recessed, semi-automatic types for kitchen areas.

RESTRICTIONS

- Do not use floor-mounted water closets except for renovation installations.
- Do not use washer-less faucets employing thermoplastic "nipples."

RELATED DOCUMENTS

- *AOC Guide Specification - 15410, Plumbing Fixtures. (Future)*
- *AOC Guide Specification - 15430, Plumbing Specialties. (Future)*

AGENCY CONTACT - Mr. Rick Khan, PE - (202) 226-3180.

D202 - DOMESTIC WATER SYSTEMS

DESIGN REQUIREMENTS

Water Piping: All domestic water lines shall be ASTM B-88, Type “K” hard-drawn copper tube with soldered joints. Provide valves at each branch water line. Limit water pressures to 60 psig (415 kPa). Design systems to sustain at least 1.5 times the working pressure. For pipe sizes 5" and larger, use Schedule 40 steel pipe. All exposed piping in kitchens and bathrooms/restrooms shall be chrome-plated.

- **Solder:** Lead free for all potable-water piping. Use brazing filler metals (silver or copper-phosphorous alloys) for continuous operation over 180 deg. F (82 deg. C).
- **Flux:** Lead-free, water-flushable complying with ASTM B 813.
- **Fire Protection:** Domestic water piping that will support fire protection services shall be designed to support working pressures consistent with that usage.

Domestic Hot Water Systems: All hot water systems shall have redundant heaters.

- **Public Water:** Supply from central water heating system using central steam through a duplex steam to water convertor complete with a circulation pumps, mixing valves, thermometers, etc. Provide 105 deg. F water at faucets.
- **Food Service Water:** Supply from central water heating system using central steam through a duplex steam to water convertor complete with a circulation pumps, mixing valves, thermometers, etc. Provide 140 deg. F water to kitchens and with additional mixing valves, 105 deg. F water at sinks.

Valves:

- **Shut-Off Valves:** Use ball or gate valves on piping up through 2" diameter. Use flanged gate valves on piping above 2" diameter. Ball valves shall have stainless steel balls and stems.
- **Balancing Valves:** Use globe-type valves.
- **Back-flow Devices:** To match the level of hazard.

Showers: Provide thermostatic mixing valves for all showers.

Insulation: Provide minimum 1" fiberglass pipe insulation on all domestic cold, hot, and recirculating water lines. Provide a canvas covering to insulation jacket on piping which is installed in exposed areas (corridors, mechanical rooms, etc.).

Pipe Escutcheons: Use split escutcheons at all wall penetrations.

Hanger and Support: Comply with types, sizes, and spacing provided in the AOC Guide Specification.

Hose Bibbs: One per 100 ft. of exterior wall, a minimum of one per building elevation. [Provide vacuum breakers.](#)

RESTRICTIONS

- Do not use butterfly valves in domestic plumbing.
- Avoid placing plumbing in exterior walls.
- Do not use “plastic” piping within buildings.
- Do not use galvanized piping.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 15140, Domestic Water Piping. (Future)*

AGENCY CONTACT - Mr. Rick Khan, PE - (202) 226-3180.

D203 - SANITARY WASTE SYSTEMS

DESIGN REQUIREMENTS

General: All plumbing fixtures, drains and equipment requiring drainage shall be arranged for gravity flow with connections to public sewers.

Piping: Brace all piping 5" and larger according to CISPI standards.

- ***Above Grade Piping:*** Service weight cast iron, no-hub with CISPI couplings
- ***Below Grade Piping:*** Use bell and spigot couplings.
- ***Direct Burial Piping:*** Protect piping from external corrosion.

Grease Traps: Provide grease interceptors in all areas where food preparation occurs. Where possible, provide exterior concrete interceptors in locations readily accessible by service vehicles.

RESTRICTIONS

- Do not use sewage ejectors without written permission of the AOC.
- Do not use PVC pipe without written permission of the AOC.
- Do not use galvanized pipe. (The AOC has a history of galvanized pipe corrosion).

RELATED DOCUMENTS

- *AOC Guide Specification - Section 15150, Sanitary Waste and Vent Piping. (Future)*

AGENCY CONTACT - Mr. Rick Khan, PE - (202) 226-3180.

D204 - RAIN WATER DRAINAGE SYSTEMS

DESIGN REQUIREMENTS

General: Do not build storm leaders into inaccessible construction, especially do not encase leaders in masonry or concrete where freeze/thaw cycling of conducted water could crack either piping or structure.

Service Design Standard: Design rain water drainage systems to accommodate “100 year storm.”

Piping: Use no-hub piping above grade in buildings to facilitate easier maintenance and replacement. See guide specification for below grade recommendations.

Roof Drains: Locate roof drains where structural creep will not affect water in-flows. Roof drains shall be cast iron body type with high dome grates and membrane clamping rings. Provide a separate overflow drain adjacent to each roof drain. Fabricate overflow drain in the same manner as the roof drain but include the damming weir extension. ^{GSA}

RESTRICTIONS

- Do not use galvanized steel piping.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 15160, Storm Drainage Piping (future)*

AGENCY CONTACT - Mr. Rick Khan, PE - (202) 226-3180.

D300 - HEATING, VENTILATING, & AIR CONDITIONING

DESIGN REQUIREMENTS

General: The following standards of design of the Office of the Architect of Capitol apply to heating ventilating and air conditioning (HVAC) systems. Our goal where possible is to design systems with a 50 year useful life, unless otherwise noted.

- **Energy Allowance:** Design should stress energy efficiency, complying with ASHRAE Standard 52.

HVAC Design Criteria:

- **Outdoors Design Temperatures & RH:**

	Summer			Winter		
	Deg. F	Deg. C	%RH	Deg. F	Deg. C	%RH
Conditions	95	35	50	0	-18	30

- **Indoor Design Temperatures & RH:** The following ranges are provided for general reference - specific Programs of Requirements for individual projects may override these provisions.

Space	Summer			Winter		
	Deg. F	Deg. C	%RH	Deg. F	Deg. C	%RH**
Offices	73	24	50	70	21	40
Conference Rooms	73	24	50	70	21	40
Toilets/Lockers	78	26	60	70	21	30
ADP Rooms *	70	21	50	70	21	40
Storage (General)	80	27	60	60	21	20
Mechanical Spaces	85	29	60	60	21	20

* Verify special equipment requirements.

** ASHRAE 62, 1999 recommends %RH to be between 30 - 60% for habitable spaces.

- **Pressurization:** Provide negative pressure to toilet rooms, showers, lockers, custodial areas, kitchens, garages, and battery charging areas. Provide for exhaust at kitchens (with no air to be re-circulated).
- **Required Air Changes:** Ventilate per International Mechanical Code.

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- **Zoning Criteria:** Do not exceed 2,000 square feet per zone (except for single rooms which are larger than 2,000 sq.ft.).
- **Special Areas:** In addition to design requirements specified for general areas, provide the following in these specialized areas:
 - **Entrance Vestibules:** Provide for supplemental heating in security stations at entrance vestibules.
 - **Elevator Machine Rooms:** Include equipment heat loads in machine room calculations to assure long-term serviceability of computer controllers. Room design temperature should be in accordance with equipment manufacturer's recommendations.

Heating Systems:

- **Heating Hot Water:** Design velocity - D3043, Hydronic Distribution Systems. Total system temperature drop - 20° F.
- **Piping Systems:** Provide 2-pipe systems. Only use series loops for terminal or branch circuits.
- **Terminal Units:** Provide manual bleed valves at all terminal units.

Cooling Systems:

- **Chilled Water:** For facilities connected to the AOC central system, design temp. of water is 42° F entering with preferred ΔT of 20° F (62° F leaving). For systems not connected to the AOC central system use ΔT compatible with refrigeration equipment.
- **Piping:** See below.
- **Special Uses:** Provide packaged units for computer equipment rooms with control systems that will maintain conditions within required tolerances.

Materials and Equipment: Comply with the following minimum requirements:

- **Mechanical Piping:**
 - Low pressure steam supply piping, and chilled water piping 2-1/2" and greater shall be Schedule 40 black steel, welded or flanged. Low pressure steam piping 2" and less shall be Schedule 40, screwed connections.
 - Screwed steam condensate piping, and chilled water piping 2" and less shall be Schedule 80 black steel.
 - Low pressure heating hydronic piping, and condensate drain piping shall be copper, [ASTM B88, Type L](#), and below grade use shall be [Type K](#).
- **Water Piping Specialties:** All chilled water piping, fittings, valves, strainers, etc. associated with the Capitol Power Plant Central Chilled water system shall be rated at Class 150. All other low pressure mechanical piping specialties shall be rated at Class 125 or greater.

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- **Sizing Criteria:** Piping up to 2" in diameter shall have velocities that do not exceed 4 ft./sec. Piping 2-1/2" in diameter and greater shall have velocities that do not exceed 7 ft./sec. Water piping friction loss should never exceed 6 ft. of water pressure drop per 100 ft. of piping length.

Fans: AMCA rated. Heavy gauge seam welded construction adequately braced with structural steel shapes for rigidity. Continuously welded blades. Drain at low point. Rust inhibiting primed surfaces. Vibration isolation. High efficiency motor. With access door. Use non-corrosive materials (aluminum or stainless steel) for fans serving moist air streams (toilet rooms, dishwashers, showers, etc.).

- **Bearings:** Double row, spherical roller, horizontally split pillow block type. Min. B-10 life 80,000 hours.
- **Acceptable types:** Centrifugal - airfoil, backward curved, backward inclined; Vaneaxial, and Propeller.
- **Battery Rooms or Charging Areas:** Use spark-proof fan.

Filters:

- **AHUs:** High efficiency [cartridge](#) type - 95% efficient, with 2" 30 - 40% efficient pre-filter.
- **Fancoils:** 1" thick pleated media.

Building Automation Systems: Comply with AOC *BAS Master Plan* and AOC *BAS Top Level Requirements*, available from the Air Conditioning Engineering Division.

RESTRICTIONS

- Do not use large forward curved fans on air handling units because of lower efficiency and longevity.

RELATED DOCUMENTS

AGENCY CONTACT - Mr. Rick Khan, PE - (202) 226-3180.

D302 - HEAT GENERATION SYSTEMS

DESIGN REQUIREMENTS

General: Heat generation (steam) within the main Capitol Complex is provided by the United States Capitol Power Plant with step-down to hot water within each major building. Consult AOC staff for steam availability at each building.

Heat Exchangers: *No specific standards.*

- **Shell-In-Tube:** *No specific standards.*
- **Plate:** *No specific standards.*

Boilers: *No specific standards.*

RESTRICTIONS

- Do not use (*No specific standards.*)

RELATED DOCUMENTS

- Not applicable.

AGENCY CONTACT - Mr. Rick Khan, PE - (202) 226-3470

D303 - HEAT REJECTION SYSTEMS

DESIGN REQUIREMENTS

- **Cooling Towers:** *No specific standards.*
- **Dry Coolers:** *No specific standards.*
- **Condensing Units:** *No specific standards.*
- **Condensers:** *No specific standards.*

RESTRICTIONS

- Do not use (*No specific standards.*)

RELATED DOCUMENTS

- Not applicable.

AGENCY CONTACT - Mr. Rick Khan, PE - (202) 226-3470

D3041 - AIR DISTRIBUTION SYSTEMS

DESIGN REQUIREMENTS

Air Handling Units: Air coils, fans, and filters as indicated. Construct double wall casings of minimum 22 gauge galvanized steel or aluminum outer wall with 2-1/2 lbs/cu ft density fire retardant insulation between walls. Galvanized steel interior wall on all not-wet (before cooling coil) sections. Stainless steel interior wall on all sections subject to wet conditions.

- **Pressures:** AHU should be designed to withstand a water gauge pressure differential at least 2" greater than the design differential pressure.
- **Structural Requirements:** Casing deflection is not to exceed 1/200th of casing span dimension under design working pressures.
- **Drain Pans:** Externally insulated stainless steel drain pan.
- **Maximum leakage:** 1-1/2% of scheduled air flow.
- **Access Doors:** There should be access doors between each section (Minimum 18" wide x 48" high on units that are large enough to accommodate these dimensions). Access doors shall have hinges, latches, and a minimum 4" x 4" view window. Provide interior lighting with external switching.
- **Control Dampers:** Control dampers shall be low leakage commercial aerodynamic extruded aluminum with edge seals and extruded aluminum frames. [Maximum leakage shall not exceed 4.0 cfm/sq. ft. @ 4" static pressure.](#)

Ventilation and Air Distribution:

- **Low Pressure Duct Design:** Recommend no greater than 0.1 in/100 ft. s.p.
- **Maximum Duct Velocities:** Guideline for low pressure ductwork - do not exceed 1000 ft./min. in noise-sensitive areas.
- **Noise Criteria:** Limit duct velocities or provide sound lining or attenuators to comply the following noise limits (derived from ASHRAE systems):

Room or Space	Noise Criteria
Private Offices	NC-30
General Offices	NC-35
Conference Rooms	NC-30
Hearing & Committee Rooms	NC-30
Cafeterias	NC-40
Radio & TV Studios	NC-15 or as directed.
Auditoriums	As directed.

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- Comply with OSHA required noise levels for utility and storage space ventilation.

Ductwork: Supply and return air ducts shall be designed to limit leakage one pressure class higher than that specified in SMACNA standards and shall be tested in accordance with SMACNA *Ductwork Testing Manual*. Maximum allowable duct leakage shall not exceed 50% of that allowed by SMACNA's *HVAC Air Leakage Manual*.

- **Duct Lining:** Provide fiberglass lining with acrylic coating to resist erosion and microbial growth and as needed for sound attenuation. Where erosion is of high concern, provide a perforated metal inner wall.
- **Plenum Returns:** For reasons of better indoor air quality, the AOC prefers ducting returns as opposed to ceiling return air plenums.

Ductwork Insulation: Provide the following minimum insulation systems for air distribution ductwork:

- **Concealed Areas:** 1-1/2" fiberglass duct-wrap.
- **Exposed Areas:** 1-1/2" rigid fiberglass board covered with canvas or fiberglass cloth protective finish.
- **Vapor Barriers:** Provide a vapor barrier for all insulated ductwork subject to condensation.

Outside Air Intake: Locate air intakes at or near roof areas. Do not use "at-grade" air intakes without written AOC approval.

Grease Exhaust Duct Systems: Duct construction standards shall comply with NFPA 96 and shall be reinforced and supported with the latest applicable SMACNA duct construction standards, and insulating fire barrier standards (tested in conformance with UL tests and certified for a grease fire for two hours, with zero clearance to combustibles).

RESTRICTIONS

- Do not use ferrous headers.
- Do not use galvanized drain pans.
- Do not install duct lining in ductwork subject to moisture.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 15815, Metal Ducts. (Future)*
- *AOC Guide Specification - Section 15820, Duct Accessories. (Future)*

AGENCY CONTACT - Mr. Rick Khan, PE - (202) 226-3180.

D3042 - STEAM DISTRIBUTION SYSTEMS

DESIGN REQUIREMENTS

General: The following standards of design of the Office of the Architect of Capitol apply to steam and condensate systems. Where possible, design systems with a 50 year useful life.

- **Ratings:** All low-pressure steam piping shall be rated at Class 125, unless otherwise noted. All medium and high pressure steam (above 15 psig) shall be rated at 150 or greater, based on the pressure.
- **Sizing Criteria:** Piping shall have velocities that do not exceed 8000 ft./min. Piping friction loss should never exceed 1/2 of PSI pressure drop per 100 ft. of piping length for low pressure steam.
- **Application - Low Pressure Steam supply:**

Steel Pipe, NPS 2 and Smaller: ASTM A 53, Type S (seamless) or Type F (furnace-butt welded), Grade A, Schedule 40, black steel, plain ends.

Steel Pipe, NPS 2-1/2 through NPS 12: ASTM A 53, Type E (electric-resistance welded), Grade A, Schedule 40, black steel, plain ends.

- **Application - Medium & High Pressure Steam Supply:**

Steel Pipe, NPS 2 and Smaller: Schedule 80 carbon steel with threaded joints, using Class 300 or greater fittings.

Steel Pipe, NPS 2-1/2 or Greater: Schedule 40 carbon steel with welded joints using Class 150 or greater steel fittings. Use Schedule 80 for high-pressure condensate.

- **Application - Condensate return piping:** Standard weight - steel pipe, Schedule 80.
- **Cast-Iron Threaded Fittings:** ASME B16.4; Classes 125 and 250.
- **Unions:** Provide unions on each side of condensate pumps, other equipment and piping subject to servicing or replacement.
- **Traps:** Thermostatic, float and thermostatic, inverted bucket, thermodynamic.
- **Air Vent:** Thermostatic stainless steel vent.

Valves:

- **Gate Valves, 3 Inches and Larger:** MSS SP-70, Class 150, 200-psi CWP, ASTM A 126 cast-iron body and bonnet, solid cast-iron wedge, brass-alloy stem, outside screw and yoke, teflon-impregnated packing with 2-piece packing gland assembly, flanged end connections; and with cast-iron handwheel. Use Class 125 for other uses consistent with above.
- **Ball Valves, 2 Inches and Smaller:** MSS SP-110, Class 150, 600-psi CWP, ASTM B 584 bronze body and bonnet, 2-piece construction; chrome-plated brass ball, standard port for 1/2-inch (DN15) valves and smaller and conventional port for 3/4-inch (DN20) valves and larger; blowout proof; bronze or brass stem; teflon seats and seals; threaded or soldered end connections with vinyl-covered steel

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lever handle. Use Class 125 for other uses consistent with above. Gate valves may also be used on 2" and smaller pipe.

- **Butterfly Valves:** (Not recommended unless specifically approved).
- **Globe Valves:** For flow control applications.
- **Balancing Valves:** Calibrated globe valves, with indexed positions. (Do not use calibrated 1/4 turn ball valves).
- **Medium and High Pressure Steam Valves:** Use Class 300 or greater.
- **Safety Valves:** As required for equipment according to the ASME Boiler and Pressure Vessel Code.
- **Pressure Reducing Valves:** Size, capacity, and pressure rating factory set for inlet and outlet pressures indicated.

Insulation: Provide the following piping insulation:

- **3 inch and Smaller Piping:**
 - *Low Pressure Steam and Steam Condensate:* 1-1/2" fiberglass.
 - *Medium and High Pressure Steam and Steam Condensate:* 1-1/2" through 4" fiberglass, pressure dependent.
- **4 inches and Larger Piping:**
 - *Low Pressure Steam and Steam Condensate:* 2" fiberglass.
 - *Medium and High Pressure Steam and Steam Condensate:* 3" through 4" fiberglass, pressure dependent.

Pipe Marking Colors: Comply with ASME/ANSI A13.1 - 96 and the following:

Piping Usage	Color*
High Pressure Steam (125 PSI and greater)	Dark Red
Medium Pressure Steam (<125 and >15 PSI)	Brown
Low Pressure Steam (15 PSI or less)	Yellow
Steam Condensate	Dark Blue

* Either paint or use color coded markers.

RESTRICTIONS

- See above.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 15075, Mechanical Identification (Future)*
- *AOC Guide Specification - Section 15083, Pipe Insulation (Future)*

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- *AOC Guide Specification - Section 15110, Valves - (Future)*
- *AOC Guide Specification - Section 15121, Pipe Expansion Fittings & Loops (Future)*
- *AOC Guide Specification - Section 15182, Steam & Condensate Piping (Future)*
- *AOC Guide Specification - Section 15186, Steam Condensate Pumps (Future)*

AGENCY CONTACT - Mr. Rick Khan, PE - 226-3180.

D3043 - HYDRONIC DISTRIBUTION SYSTEMS

DESIGN REQUIREMENTS

General: The following standards of design of the Office of the Architect of Capitol apply to heating ventilating and air conditioning (HVAC) systems. Where possible, design systems with a 50 year useful life.

- **Ratings:** All chilled water piping, fittings, valves, strainers, etc. associated with the Capitol Complex shall be rated at Class 150. All other low pressure mechanical piping specialties shall be rated at Class 125, unless otherwise noted.
- **Sizing Criteria:** Piping up to 2" in diameter shall have velocities that do not exceed 4 ft./sec. Piping 2-1/2" in diameter and greater shall have velocities that do not exceed 7 ft./sec. Water piping friction loss should never exceed 4 ft. of water pressure drop per 100 ft. of piping length for piping up to 2" diameter; 6ft of water pressure drop per 100 ft. of piping length for piping over 2" diameter.
- **Application - Low pressure heating hydronic piping, and condensate drain piping:** Drawn-Temper Copper Tubing: ASTM B 88, Type L or ASTM B 88, Type M. Below grade use Type K, annealed temper copper tubing.
- **Application - Chilled water (Steel Pipe, NPS 2 and Smaller):** ASTM A 53, Type S (seamless) or Type F (furnace-butt welded), Grade A, Schedule 40, black steel, plain ends. For screwed piping use Schedule 80.
- **Application - Chilled water (Steel Pipe, NPS 2-1/2 through NPS 12):** ASTM A 53, Type E (electric-resistance welded), Grade A, Schedule 40, black steel, plain ends.
- **Cast-Iron Threaded Fittings:** ASME B16.4; Classes 125 and 250.
- **Unions:** Provide unions on each side of pumps, circulators, hot water heaters, and other equipment subject to servicing or replacement.

Valves:

- **Hydronic Systems Shut-Off - Gate Valves, 3 Inches and Larger:** For chilled water uses, MSS SP-70, Class 150, 200-psi CWP, ASTM A 126 cast-iron body and bonnet, solid cast-iron wedge, brass-alloy stem, outside screw and yoke, teflon-impregnated packing with 2-piece packing gland assembly, flanged end connections; and with cast-iron handwheel. Use Class 125 for other uses consistent with above.
- **All Hydronic Systems - Ball Valves, 2 Inches and Smaller:** For chilled water uses, MSS SP-110, Class 150, 600-psi CWP, ASTM B 584 bronze body and bonnet, 2-piece construction; chrome-plated brass ball, standard port for 1/2-inch (DN15) valves and smaller and conventional port for 3/4-inch (DN20) valves and larger; blowout proof; bronze or brass stem; teflon seats and seals; threaded or soldered end connections with vinyl-covered steel lever handle. Use Class 125 for other uses consistent with above.
- **Butterfly Valves:** (Not recommended unless specifically noted). MSS SP-67, 200-psi CWP, 150-psi maximum pressure differential, ASTM A 126 cast-iron body and bonnet, extended neck, stainless-steel stem, field-replaceable EPDM or Buna N sleeve and stem seals, wafer, lug, or grooved style:

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- *Disc Type:* Nickel-plated ductile iron or elastomer-coated ductile iron.
- *Operator for Sizes 2 Inches to 6 Inches:* Standard lever handle.
- *Operator for Sizes 8 Inches to 24 Inches:* Gear operator with position indicator.
- **Globe Valves:** For flow control applications.
- **Balancing Valves:** Calibrated globe valves, with indexed positions. (Do not use calibrated 1/4 turn ball valves).

Insulation: All piping with service below 70° F shall employ a vapor barrier. All insulated piping in exposed areas shall be finished with a canvas or fiberglass cloth protective covering. Provide the following piping insulation:

- **3 inch and Smaller Piping** (above ground):
 - *Chilled Water:* 1-1/2" fiberglass w/ ASJ.
 - *Heating Water:* 1-1/2" fiberglass.
 - *Domestic Hot and Cold Water:* 1" fiberglass or 1/2" flexible elastomeric.
- **4 inches and Larger Piping:**
 - *Chilled Water:* 2" fiberglass. (Use 3" fiberglass for pipe above 8" diameter).
 - *Heating Water:* 2" fiberglass.
 - *Domestic Water:* 1-1/2" fiberglass.
- **Pipe Marking Colors:** Comply with ASME/ANSI A13.1 - 96 and the following:

Piping Usage	Color*
Chilled Water Supply (<i>Tagged CHWS</i>)	Dark Green
Chilled Water Return (<i>Tagged CHWR</i>)	Light Green
Condensate Water Supply	Blue
Condensate Water Return	Light Blue
Heating Hot Water Lines	Do not paint

* Either paint or use color coded markers.

RESTRICTIONS

- See above.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 15075, Mechanical Identification (Future)*
- *AOC Guide Specification - Section 15083, Pipe Insulation (Future)*

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- *AOC Guide Specification - Section 15100, Valves - (Future)*
- *AOC Guide Specification - Section 15121, Pipe Expansion Fittings & Loops (Future)*
- *AOC Guide Specification - Section 15181, Hydronic Piping (Future)*

AGENCY CONTACT - Mr. Rick Khan, PE - 226-3180.

D3050 - AIR COILS

DESIGN REQUIREMENTS

Chilled Water Cooling Coils: Variable flow, constant temperature system. Maximum air velocity through coil 450 ft/min.

- **Tubes:** 0.035" thick copper tubes.
- **Fins:** 0.010" thick lead-free solder coated or mechanically bonded copper fins, 10 fins/inch max.
- **Casings:** 16 gauge stainless steel casing.
- **Headers:** Non-ferrous headers.
- **Pressure:** 200 psi working pressure.

Steam Heating Coils: Non-freeze type steam distribution tube: 1" O.D. preheat, 5/8" O.D. reheat. Galvanized steel casing except stainless steel casing downstream of cooling coil or areas subject to moisture. Maximum air velocity 600 ft/min.

- **Tubes:** .035" thick copper tubes.
- **Fins:** 0.010" thick lead-free solder coated or mechanically bonded copper fins, 10 fins/inch max.
- **Casings:** 16 ga. min. stainless steel when subjected to wet conditions.
- **Pressure:** 200 psi working pressure.
- **Header:** Non-ferrous headers.

Hot Water Heating Coil: Variable flow, constant temperature system, maximum air velocity through coil not to exceed 600 ft./min.

- **Tubes:** .035" thick copper tubes.
- **Fins:** 0.010" thick lead-free solder coated or mechanically bonded copper fins, 10 fins/inch max.
- **Casings:** 16 ga. min. stainless steel when subjected to wet conditions.
- **Pressure:** 200 psi working pressure.
- **Header:** Non-ferrous headers.

RESTRICTIONS

- Avoid using aluminum fins.
- There shall be no connection of dissimilar metals that could lead to corrosion and a reduction of product life.
- [Do not locate coils in locations that will make access for maintenance or repair difficult.](#)

RELATED DOCUMENTS

- *AOC Guide Specification - Section 15761, Air Coils. (Future)*

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- *AOC Guide Specification - Section 15763, Fan Coil Units. (Future)*
- *AOC Guide Specification - Section 15764, Radiators. (Future)*

AGENCY CONTACT - Mr. Rick Khan, PE - (202) 226-3180

D3055 - HUMIDIFIERS

DESIGN REQUIREMENTS

General: No direct power plant (treated building) steam shall be used for humidification. Provide humidification via steam manifold injector humidifiers installed in the supply duct system or air handling units that uses building steam to provide “clean steam” where building steam is available. Provide high limit humidistats in the ductwork downstream of the humidifiers. Where multiple AHUs are located in close proximity and steam pressure is available, consider using a controlled steam-to-steam heat exchanger, in combination with water treatment to minimize scale (water softening).

Steam-To-Steam Type: Provide with stainless steel heat exchanger.

Electric Steam Generator Type: Provide cleanable tank type or stainless steel evaporator pan type heat exchanger.

RESTRICTIONS

- | • Do not use direct steam humidification [utilizing chemically-treated steam](#).
- Do not use electric canister type (canister replacement is costly).

RELATED DOCUMENTS

- *AOC Guide Specification - Section 15752, Humidifiers. (Future)*

AGENCY CONTACT - Mr. Rick Khan, PE - (202) - 226-3180.

D3057 - TERMINAL HEAT TRANSFER

DESIGN REQUIREMENTS

Fancoil Units: There are no fancoil units built today which have a 50 year useful life. FCUs should be chosen with quality in mind to increase the time between replacement. The casing should be a heavy gauge galvanized steel to reduce vibration. The coil tube thickness shall be as close to 0.035" as reasonable and shall be copper. The fin series shall not exceed 10 fins/inch and copper fans are preferred. Velocities through the cooling coil shall not exceed 500 ft/ min to avoid moisture carryover. All control valves, coils, fans, and filters shall be accessible for maintenance and cleaning. Forward curved fans are acceptable but fan casings shall be adequately braced and isolated to avoid vibration. Filter as indicated above. A non corroding drain pan (stainless steel, plastic, etc.) shall be positioned under cooling coil and an auxiliary drain pan under the control valve.

Finned Tube Radiators: Copper-tubes fins preferred.

Unit Heaters: Copper fins and tubes preferred.

Cabinet Heaters: See fancoil units above. All items apply except those associated with cooling.

VAV Boxes: DDC controlled, with reheat coil pressure independent.

RESTRICTIONS

- Avoid fan powered boxes where noise level is a concern.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 15763 - Fan-Coil Units (Future)*
- *AOC Guide Specification - Section 15764 - Radiators (Future)*
- *AOC Guide Specification - Section 15766 - Cabinet Unit Heaters (Future)*
- *AOC Guide Specification - Section 15767 - Propeller Unit Heaters (Future)*
- *AOC Guide Specification - Section 15768 - Unit Heaters Ventilators (Future)*
- *AOC Guide Specification - Section 15840 - Air Terminal Units (Future)*

AGENCY CONTACT - Mr. Rick Khan, PE - (202) 226-3180.

D401 - FIRE PROTECTION SPRINKLER SYSTEMS

DESIGN REQUIREMENTS

Automatic Sprinkler Systems: Provide automatic sprinkler systems throughout all new construction projects and in all major renovation projects in accordance with NFPA13 and the Building Code, and the following:

- **All Areas:** Provide automatic sprinklers in all areas including “elevator machine rooms, boiler rooms, mechanical equipment rooms, walk-in freezers and cold rooms, essential electronic facilities, electrical closets, telephone closets, emergency generator rooms, uninterruptable power service and battery rooms, transformer vaults, telephone exchange (PABX) rooms, etc.”^{GSA} Exceptions to this coverage shall be obtained in writing from the AOC Fire Marshal.
- **Wet-Pipe Systems:** All sprinkler systems shall be wet-type unless installed in areas subject to freezing. [Pre-action systems are not permitted.](#)
- **Areas Subject to Freezing:** Provide dry pipe systems, dry pendant systems, provide space heating, or re-route the sprinkler piping.^{GSA} [Heat-tape and anti-freeze systems are not accepted by the AOC.](#)
- **Raised Floors:** Areas of new construction utilizing raised floor areas shall have the floor sloped to an installed drain wherever possible. Size drain for sprinkler design flow.

Standards for Sprinkler Design: The standards listed below will be used by AOC staff as the basis for design reviews and approvals.

- **National Fire Protection Association (NFPA):** *Installation of Sprinkler Systems, NFPA 13.*
- **National Fire Protection Association (NFPA):** *Installation of Standpipe, Private Hydrant, and Hose Systems, NFPA 14.*
- **National Fire Protection Association (NFPA):** *Stationary Pumps for Fire Protection, NFPA 20.*
- **National Fire Protection Association (NFPA):** *Standard for Parking Structures, NFPA 88A-2002.*

Water Supply & Fire Pumps: Verify adequacy of water supply by obtaining water supply flow testing from the local jurisdiction. If the test data is older than 1 year, perform water supply testing of fire hydrants and as applicable fire pumps. Flow rates and pressures shall comply with NFPA 13 and the Building Code. If flow rates and pressures do not meet requirements, provide a fire pump.

- **Sizing:** Size the fire pump to meet sprinkler system requirements only. Provisions for manual fire fighting will be provided by the responding fire department.^{GSA}
- **Design:** Provide electric motor driven, horizontal split case centrifugal type fire pumps.^{GSA}
- **Transfer Switches:** Provide fire pumps with automatic transfer switches suited for emergency generator services even if emergency generator is not immediately available.
- **High-Rise Buildings:** Buildings classified as High-Rise under the Building Code, [or Principal or Support buildings by these standards](#), shall be equipped with a redundant fire pump.

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- **Redundancy:** Where practicable, provide redundant [building](#) water supplies [and where not practicable, provide connections to a common supply at points as remote as possible from each other.](#) Design all fire pumps to accommodate the lesser of the two supplies.
- **Activation:** Design fire pump to start automatically at 10 psi below jockey pump start pressure. Design fire pumps for manual shut down.
- **Fire Pump Controller:** Provide factory assembled, integrated power transfer switch and fire pump controller unit monitored by the fire alarm system.
- **Jockey Pump:** Provide jockey pump sized to make up the allowable leakage rate within 10 minutes or 1 gpm, whichever is larger unless directed otherwise in writing by the AOC.

Sprinkler System Design: Hydraulically calculate sprinkler systems in accordance with the requirements of NFPA 13 and the following:

- **Minimum System Design:** Use a minimum system design area of 1,500 sq. ft. [Minimum design density shall be Ordinary Hazard, Group 2.](#)
- **Extended Coverage Heads:** If extended coverage sprinkler heads are utilized, hydraulic calculations are required. Complete the calculation back to the fire pump discharge or the fire hydrant which was flow tested.
- **Modifications of Existing Systems:** Any modifications of existing systems that cause the addition of 3 or more sprinklers shall be done in accordance with the pipe schedule method as outlined in NFPA 13. Any modifications of existing systems that cause the addition of 10 sprinklers shall have calculations completed back to the fire pump discharge or the fire hydrant that was flow tested.
- **Safety Factor:** [Hydraulic calculations shall provide a safety factor of 10 psi .](#)

Sprinkler Heads: All sprinklers and sprinkler escutcheons installed in AOC new construction or renovation projects shall be Underwriters Laboratories Inc. (UL) listed.

- **Sprinkler Heads:** Provide quick response [sprinklers, except in elevator machine rooms.](#)

Sprinkler System Piping: [Sprinkler piping, fittings, control valves, check valves, and drain assemblies shall meet the requirements of NFPA 13. The requirements below supersede the requirements of NFPA 13:](#)

- [Black steel piping](#) and/or copper tubing shall be used for all wet-pipe sprinkler piping.
- [Galvanized](#) (internal and external) sprinkler piping shall be used for all dry-pipe sprinkler systems.
- [Steel pipe sizes](#) 2 inches and smaller shall be Schedule 40 and shall be threaded.
- [Steel pipe sizes](#) larger than 2 inches shall be minimum Schedule 10. Piping less than Schedule 40 shall be roll-grooved.
- [Threadable](#) lightweight pipe shall not be used.
- [Piping](#) having a corrosion resistant ratio less than 1 shall not be used.
- [Plain-end fittings](#) shall not be used. GSA

Special Sprinkler Systems: Provide the following for sprinklers installed in electrical equipment spaces:

- All elevator machine rooms, all electrical switchgear rooms, [all transformer vaults](#), and all essential electronic facilities “shall be provided with separate manual isolation valves and a separate water flow

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switch located outside the room in an accessible location. Tamper switches shall be provided on all such valves.”^{GSA}

- Sprinklers mounted less than 7 feet above the floor and in electrical rooms and electrical closets shall be equipped with sprinkler guards to provide protection against accidental damage.

Floor Control Valves: All floor control valves shall include a control valve, flow switch, test connection, and method for draining test flow discharge water.

RESTRICTIONS

- [See above.](#)

RELATED DOCUMENTS

- *AOC Guide Specification - Section 13915, Fire-Suppression Piping.*
- *AOC Guide Specification - Section 13920, Fire Pumps.*

AGENCY CONTACT - Mr. John Williams, PE - (202) 226-2645

D402 - STANDPIPE & HOSE SYSTEMS

DESIGN REQUIREMENTS

Standpipes: Provide standpipes as required by the Building Code and by the following:

- “All standpipes shall be connected to the fire protection water supply, be permanently pressurized, and be installed in accordance with NFPA 14.”^{GSA}
- “Dry standpipes shall only be permitted in spaces subject to freezing.”^{GSA}
- “Where standpipe and sprinkler systems are required, a combination sprinkler/standpipe system design shall be provided.”^{GSA} In this arrangement, the fire pump shall be sized for the sprinkler system only.
- [For all garage areas, the requirements of NFPA88A \(2002 Edition\) - “Standard for Parking Structures” shall apply.](#)

Fire Department Hose Outlets: Provide Class 1 and Class 2 standpipe capability. “Threads and valves shall be compatible with the local fire department requirements.”^{GSA}

RESTRICTIONS

- N.A.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 13915, Fire-Suppression Piping*

AGENCY CONTACT - Mr. John Williams, PE - (202) 226-2645

D4030 - FIRE PROTECTION SPECIALTIES

DESIGN REQUIREMENTS

General: Provide portable fire extinguishers and cabinets [throughout](#) in accordance with provisions of the [NFPA 10](#).

RESTRICTIONS

- Do not compromise fire partition construction to install recessed or semi-recessed fire extinguisher cabinets.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 10520, Fire-Protection Specialties. (Future)*

AGENCY CONTACT - Mr. John Williams, PE - (202) 226-2645

D4040 - SPECIAL FIRE PROTECTION SYSTEMS

DESIGN REQUIREMENTS

Storage Facilities: General and rack storage facilities shall comply with the requirements of NFPA 13, *Installation of Sprinkler Systems*. GSA

- **Record Storage:** The storage arrangements and protection of the facility shall comply with the above and NFPA 232.
- **Archive and Record Storage:** In addition to the above, comply also with information provided in NFPA 232A and the National Archives and Records Administration (NARA) guidelines as published in the Federal Register. GSA
- **Smoke Detectors:** Install smoke detectors throughout archival storage areas in accordance with NFPA 72, National Fire Alarm Code. GSA

Essential Electronic Facilities: In computer rooms, telephone switch rooms, and other mission critical electronic facilities comply with the requirements of NFPA 75, *Standard for the Protection of Electronic Computer/Data Processing Equipment*, 1999 Edition.

- **Wet Pipe Systems:** Serve all areas, including data storage areas, with wet pipe sprinkler systems employing quick response sprinklers.
- **Isolation Valves:** Provide separate manual isolation valves and a separate water flow switch located outside the room in an accessible location. Tamper switches shall be provided on all such valves and connected to the fire alarm system. GSA
- **Equipment Shutdown:** Activation of the sprinkler water flow switch shall disconnect power to electronic equipment and the HVAC system with no time delay. "Activation of two cross-zoned smoke detectors within a single protected area shall disconnect power to the computer equipment and to the HVAC system after a pre-set time delay." GSA

Cooling Towers: Provide fire protection in accordance with NFPA 214, *Standard on Water-Cooling Towers*, 2000 Edition.

| **Child Care Centers:** [Follow Building Code requirements.](#)

| **Laboratories:** [Follow Building Code requirements.](#)

| **Track Files:** "A track file uses a single aisle to give access to an otherwise solid group of open-shelf files. Access is gained by moving shelf units on rollers along a track until the proper unit is exposed." GSA

- [The track file system shall be constructed entirely of steel. At least 18-gauge sheet metal shall be used for all parts of the shelving unit.](#)

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- The system shall be no more than 8 feet high, and a minimum clearance of 18 inches shall be maintained between the top of the shelving and the ceiling.
- The sprinkler density shall be 0.3 gpm/sq.ft. over 1500 sq.ft. Sprinkler spacing shall be 100 sq.ft. maximum.
- Clearance between units shall be a minimum 2 inches when filing system is in the closed position. To accomplish this mount the bumpers on the face of each unit.
- The back cover of stationary end files shall be solid sheet metal. GSA

RESTRICTIONS

- See above.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 10672, Compact Storage Shelving. (Future)*

AGENCY CONTACT - Mr. John Williams, PE - (202) 226-2645

D500 - ELECTRICAL SYSTEMS

DESIGN REQUIREMENTS

General: Buildings within the Congressional Complex are historic and have a very long useful life. Base electrical design on components that have both long life and energy efficiency. For renovation and alteration projects, evaluate existing conditions and electrical systems. For new facilities, coordinate incoming power with PEPCO. Do not compromise the historic integrity of the complex.

Regulations and Codes: Comply with the following:

- [The International Electric Code](#) and the National Electric Code (NEC), (NFPA-70).
- The Life Safety Code, NFPA 101.
- Base lighting requirements on Illuminating Engineering Society of North America (IESNA).

Design Considerations: Comply with the following electrical system design considerations:

- Electrical and telecommunications closets shall be stacked vertically. Provide future allowance for growth.
- Replace tapped feeders with separate feed for panelboards from distribution panelboards.
- Replace feeders 30-40 years old with new.
- Provide temporary electrical service/ feeders in affected areas.
- Provide legislative clock outlet in each Congressional Suite.
- Locate transformer vaults and switchgear/switchboards in central area for ease of distribution of secondary service.
- Provide ground wire with branch circuit wiring.

Legislative Call System: Electrical equipment specified to be installed shall have no effect on the Legislative Call electronic signal system.

Closets: Provide separate closets for electrical and telecommunications use, minimum size 8 ft. x 8 ft. Telecommunication Closets shall serve telecommunication systems only. In each closet provide one double duplex receptacle.

Mechanical Rooms: Coordinate location of light fixture with mechanical layout of ducts and piping. Provide convenience receptacles on each wall.

Ground Bus: provide wall ground bus in each electrical room housing switchgear or substations. Interconnect bus with ground electrode and ground bus in switchgear. Ground resistance shall not exceed 5 ohms. All grounding shall conform to NEC.

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Non-Linear Loads: Verify and coordinate electrical requirements for all VFD, SCR loads for normal and emergency service.

Radiation: Provide shielding for rooms above switchgear rooms to minimize EMF interference.

Other Systems: Coordinate and provide empty conduit systems, accessories, and power supplies for Fire Alarms, Telecommunications, Security, Intercom, CATV, etc.

Future Expansion: Coordinate and provide empty conduit systems, accessories, and power supplies for Fire Alarms, Telecommunications, and Security. Provide sufficient capacity in panelboards, including branch circuit breakers, to handle unassigned space loads.

Loads for Unassigned Spaces: Provide the following minimum design loads for unassigned office spaces:

- **Lighting:** 3 watts/sq. ft.
- **Power:** 2 watts/sq. ft.
- **Mechanical:** 6.0 watts/sq. ft.
- **Provisions for PCs, monitors, telecommunications/data outlets:** 1 per 75 sq. ft.
- **Provisions for FAX and printers:** 1 per 300 sq. ft.
- **Loads for Data Processing Centers:** 50 watts/sq. ft. (Assume 20% of unassigned space is data processing area).
- **Panelboards:** Provide sufficient capacity in panelboards, including branch circuit breakers, to handle unassigned space loads.
- **Closets:** Provide electrical/telephone/security closet spaces.

RESTRICTIONS

- **Conductors:** Minimum wire size shall be #12 copper served from a 20 amp breaker.
- **Conduit:** Minimum conduit size shall be 3/4."
- **Loads:** Do not exceed 1500-1600 watts for lighting circuits on 120 volt system, 3600 watts for 277 volt system.
- **Ballasts:** Do not use electronic ballasts for fluorescent fixtures as they cause interference with the Legislative Call system (use hybrid ballast and T8 lamps) without written AOC approval.
- **Grounding:** Do not use conduit as a grounding conductor.
- **Materials:** Do not use aluminum conductors, aluminum buses in switchgears, panelboards or aluminum transformers.
- **Monitoring:** Provide monitoring of all breakers in switchgears/switchboards to be connected to IMPACC system.
- **Breakers:** Do not use "series" rated circuit breakers.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 16050, Basic Materials and Methods (Future)*

AGENCY CONTACT - Ms. Annette Kim, PE - (202) 226-3470.

D501 - ELECTRICAL SERVICE & DISTRIBUTION

GENERAL

Distribution: Buildings within the Congressional Complex are typically served through PEPCO's 13.8 KV service to AOC 13.8 switchgear, distributed through network transformers to low voltage switchgears.

DESIGN REQUIREMENTS

Medium Voltage Switchgear: 13.8 kV, 1200 Amp, 3 phase, 3 wire. Design of a medium voltage switchgear shall be fully compatible with PEPCO requirements. Responsibility of single line approval rests with the designer. Clearly mark PEPCO feeder numbers on drawings and label each cell.

- **Interrupting Capability:** 750 kVA (28 kA).
- **Sensors:** Provide 3 sets of sensors (PT's and CT's) on each feeder: over-current and under-voltage protection; PEPCO metering; AOC metering and monitoring. [CT connections shall be through shorting circuiting type terminal blocks.](#)

Breakers: Use enclosed, draw out type vacuum interrupters as breaker. Control breaker by [125 VDC](#) (from battery). [Use H.V. branch breaker to feed power transformers. A maximum of two transformers per branch breaker are permitted.](#)

Battery System: Coordinate battery system with the AOC High Voltage Shop. The batteries and battery charger shall be sized to allow all breakers to be tripped 2 times and closed 2 times. The batteries shall be a maintenance-free type.

Mounting: 4" high concrete pad.

Monitoring: [The 13.8 kV switchgear monitoring shall be](#) compatible with AOC IMPACC monitoring system. Vendor of new medium voltage switchgear shall provide all necessary software, licenses and hardware to interface the existing IMPACC monitoring network.

Communications: Provide data-jack (Ethernet) in each switchgear room.

RESTRICTIONS

- Do not use aluminum bus.

RELATED DOCUMENTS

- AOC Design Standard "Integrated Monitoring System".
- *AOC Guide Specification - Section 16341, Medium-Voltage Switchgear (Future)*

AGENCY CONTACT - Ms. Annette Kim, PE - (202) 226-3470.

D5011.1 - NETWORK TRANSFORMERS

DESIGN REQUIREMENTS

Type: Standard configuration: 3 or 4 units, unless specific design requirements dictate otherwise.

- **Outside Building:** If design conditions allow for space outside the building (a transformer vault), use liquid cooled network transformers.
- **Inside Building:** Inside building use dry type network transformers.

Ratings:

- **kVA Rating:** Per load calculation and spot network system design. As a minimum provide for single contingency condition (one transformer out of service). Select one of the typical rating of 500, 750 or 1000 kVA.
- **Impedance :** 5 % or greater.
- **H. Voltage:** 13,800 V (delta).
- **Prim. Taps:** Full capacity, (2) 2½ % above and (2) 2½ % below nominal voltage.
- **L. Voltage:** 480 (wye)/277 V or 208 (wye)/120 V.
- **Fuse Location:** External.
- **Mounting:** Direct on transformer secondary throat.
- **Operating Mechanism:** Spring Close
- **Withdrawal Mechanism:** Drawout.

Materials: Primary and secondary windings: Copper

Terminals: Transformer secondary terminal built according to IEEE C.57.12.40 to accept directly mounted network protector.

Monitoring: Monitor network transformers by addressable relay or by a programmable logic controller (PLC) to monitor the status (open/closed) of discrete contacts. Integrate the output into the existing IMPACC monitoring system with display on a remote computer. Mount the relays or PLC in an enclosure and wired to a terminal block. For details of monitoring requirements see AOC Design Standard “Integrated Power Distribution Monitoring System.”

Specific Requirements for Liquid Cooled Network Transformers: Transformer shall be equipped with three-position, liquid filled primary switch (the third position for grounding the incoming feeder).

- Provide gauges for transformer temperature and coolant level.

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- Provide contacts (wired to a common terminal strip) for the following alarms: Temperature high and high/high, low coolant level, and high pressure.
- Mounting on 4" high concrete pad.

Specific Requirements for Dry Network Transformers: The transformer shall be designed to carry short time emergency overloads in accordance with ANSI C57.96 as applicable. Duration and magnitude of designed withstand capability shall be as outlined in ANSI Standards and the latest draft of the IEEE Short Circuit Test Code.

- **Primary Switch:** Equip transformer with two-position primary dry switch.
- **Winding temperature rise:** 80°C above 40°C ambient at full rated linear load with 220°C insulation system.
- **Double-Rated Transformers:** The transformer shall include all devices, wiring, fans and auxiliary equipment necessary for automatic temperature controlled forced air cooling to obtain an additional capacity. Control power for fans shall be 208 V single phase. Provide fuse protection for this circuit.
- **Sensors:** Embed transformer winding temperature sensor(s) in the winding; local temperature readout; and "high" and "high/high" alarm contacts for remote monitoring.

RESTRICTIONS

- Not applicable.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 16461, Dry-Type Transformers (future)*

AGENCY CONTACT - AOC, Electrical Engineering Division - (202) 226-3470.

D5011.2 - NETWORK PROTECTORS

DESIGN REQUIREMENTS

Network Protectors: Network protector status (open/closed) shall be monitored by addressable relay or by a programmable logic controller (PLC). Integrate the output into the existing IMPACC monitoring system with display on a remote computer. Mount relays or PLC in an enclosure wired to a terminal block.

- **Type:**

Network configuration: Three units (unless stated otherwise).

Mounting: Direct, on transformer secondary throat.

Operating mechanism: Spring close.

Withdrawal mechanism: Draw-out.

Fuse location: External.

- **Rating:**

Voltage: 480 V or 208 V

Ampacity: Depends on network configuration and power transformer kVA. For (3) unit, 480 V network, 500 kVA transformers the Network Protector ampacity should be 1200 A. For (3) unit, 208 V network, 500 kVA transformers the Network Protector ampacity should be 2000 A.

Integrated Monitoring System: All new-installed power distribution equipment shall be equipped with a complete monitoring system capable to provide positive two-way, real time communication with two remote computers via the existing Ethernet network. The requirement is concerned with new-installed high and low voltage switchgear, power transformers, network protectors and emergency generators.

- **Existing System:** At the present, the majority of buildings within the Congressional Complex are covered by an operating power distribution monitoring system IMPACC by Cutler Hammer. It utilizes Ethernet communication network, Windows NT, PowerNet software by Cutler Hammer and Factory Suite 2000 software by Wonderware Corp.

PowerNet software provides data display and alarms on two remote computers in a tabulated format.

Factory Suite software provides data display and alarms on two remote computers in graphics.

- **New Installations:** The vendor of new power distribution equipment shall provide all necessary software, licences and hardware to interface the existing IMPACC monitoring network and to display data on the remote existing master and auxiliary computers.

Monitoring system of new equipment shall match the existing operating IMPACC system, as a minimum, in the graphical part of the data display. The new system shall be fully compatible with

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WonderWare 7.0, including NetDDE module, and using TCP-IP (Ethernet) protocol. Graphical data shall match the existing display format (single lines, front views, annunciators). Provide detailed information documenting how a seamless interface is to be accomplished with the output in WonderWare format.

Data display of new equipment in a tabulated format could be accomplished by running a new system software concurrently with the PowerNet software.

- ***Switchgear and emergency generator monitoring systems:*** Include metering devices at each circuit breaker and each incoming line. Included in the package should be a suitable computer (local monitoring computer) with peripherals to serve as an interface between local monitoring network and the Ethernet network.
- ***Power transformers (transformer vaults) and automatic transfer switches:*** Monitor by addressable relay or by a programmable logic controller (PLC) to monitor the status (open/closed) of discrete contacts. Integrate the output into the monitoring system with display on a remote computer. Mount relays or PLC in an enclosure wired to a terminal block.

RESTRICTIONS

- Not applicable.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 16341, Medium Voltage Switchgear (Future)*
- *AOC Guide Specification - Section 16350, Medium Voltage Transformers (Future)*
- *AOC Guide Specification - Section 16231, Packaged Engine Generators (Future).*

AGENCY CONTACT - Ms. Annette Kim, PE - (202) 226-3470.

D5011.3 - LOW VOLTAGE SWITCHGEAR

DESIGN REQUIREMENTS

Low Voltage Switchgear: 277/480 V, 3 phase, 4 wire plus ground or 120/208 V, 3 phase, 4 wire plus ground.

- Full capacity (100 % of phase bus rating) neutral bus in all branches of 208 V substation units and standard neutral bus for 480 V switchgear lineups.
- Bus ampacity as per load calculation. Minimum bus bracing 100 kA.
- Interrupting capability: as per short circuit calculation.
- All bus bars shall be tin plated solid copper. Ground bus minimum size ¼" x 2".
- Provide ground fault protection per NEC.

Configuration: Incoming line and all load raceways mounted on the top, unless noted otherwise.

- Rear covered with hinged doors (preferable) or removable screw-on plates.
- Provide an approved mimic bus on the front of each switchgear.
- Provide laminated nameplates on the front of the switchgear. Lettering min. 3/4" high for each device, meter, etc.
- Mounting on a 4" high concrete pad.

Clock Interface: For each section of 120/208V switchgear main bus provide a 100 A, 3 ϕ fusible disconnect switch (40 A fuses) mounted in a cable compartment and with line side tapped to the switchgear bus by #1 AWG wires. The disconnect will be used to superimpose on the switchgear bus a 10 kHz signal for the congressional clock system

Emergency Shutdown: For each switchgear lineup provide emergency shutdown control equipment:

- **Switch:** Spring return control switch with pistol grip [Westinghouse W2, Style No.3677A34G03], with lockout capability and with (2) NO momentary contacts in each, the TRIP and the CLOSED positions; located on the center line, 30" above floor level;
- **Indicating lights:** Three red, 125 VDC; located symmetrically on a horizontal line 34" above floor level;
- **Terminal Block:** (16) point terminal block to accommodate wiring of the above items; location in the far rear of the incoming line section;
- **Labels:** Plastic laminate nameplate *480 V SWITCHGEAR EMERGENCY SHUTDOWN* located below the switch.

Metering: Provide separate metering device for each incoming lines (network transformers or step down transformers). Integrate all measured parameters and alarms into a supervisory and monitoring system.

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Monitoring: Provide a complete monitoring system to cover all vital elements of the switchgear and the associated equipment. Integrate the system with the existing power monitoring system IMPACC and be able to communicate with a remote computer via the existing Ethernet communication network.

- **System:** Provide a system of addressable relays or a programmable logic controller of sufficient capacity to monitor the status of equipment associated with the switchgear (network transformers, network protectors). The system shall be capable of monitoring the status (open/closed) of the (24) discrete contacts. The output shall be integrated into the supervisory and monitoring system with display on a remote computer.
- **Communications:** Provide data-jack (Ethernet) in each room.

RESTRICTIONS

- Not applicable.

RELATED DOCUMENTS

- AOC Design Standard “Integrated Monitoring System.”
- *AOC Guide Specification - Section 16430, Switchgear. (Future)*

AGENCY CONTACT - Ms. Annette Kim, PE - 226-3470.

D5013.8 - BUS DUCTS

DESIGN REQUIREMENTS

General: Buses shall be copper and rated for continuous current amperes, 3-phase, [3 or 4 wire as required by the system](#), and include integral or internal 50% ground bus. Calculate short circuit rating based on root mean square (RMS) symmetrical amperes minimum.

Busway systems shall be suitable for use indoors. Enclosures shall be metallic.

- Run bus ducts parallel with or at right angles to ceilings, walls, and structural members.
- Support bus duct at 5-foot maximum intervals and brace to prevent lateral movement.
- Provide fixed type hinges on risers.
- Provide flanges where bus duct penetrate walls and floors, and seal to maintain smoke and fire ratings.

Hot Spot Temperature: Maximum hot spot temperature rise at continuous rated load shall not exceed 55 deg. C. above the maximum ambient temperature of 40 deg. C. in any position. Voltage phasing of entire bus duct system shall be coordinated properly.

RESTRICTIONS

- Do not use aluminum bus duct.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 16450, Enclosed Bus Assemblies. (Future)*

AGENCY CONTACT - Electrical Engineering Division - (202) 226-3470.

D5015 - BRANCH CIRCUIT PANELBOARDS

DESIGN REQUIREMENTS

General: Comply with requirements of UL 67 and UL 50. Use door-in-door construction, with concealed hinges. [Provide continuous hinge for the entire front of the box](#) with standard door with hinged trim cover. [Provide](#) for all panelboards of all sizes.

- **Minimum short circuit rating:** 10,000 amperes symmetrical.
- **Panelboard Bus:** Hard-drawn copper, 98% conductivity.
- **Isolated Copper Neutral Bus:** Provide in each panel for connection of circuit neutral breakers. Provide double size neutral for panelboards when loads served are non-linear (typically office suite loads), served from K rated transformer or harmonic canceling transformers.
- **Copper Ground Bus:** Separate bus identified as equipment grounding bus for connecting grounding conductors and bond to steel cabinet.
- **Branch OCPDs:** Bolt-on circuit breakers, replacement without disturbing adjacent units.

Circuit Breakers: UL 489, thermal magnetic-type having a minimum short-circuit rating equal to the short-circuit rating of the panelboard. Provide breaker terminals listed as suitable for the type of conductor used.

Multipole Breakers: [Provide](#) trip-type with single operating handle. Breaker design shall be such that overload in one pole automatically causes all poles to open. Maintain phase sequence throughout each panel so that any three adjacent breaker poles are connected to Phases A, B, and C, respectively.

GFCI Circuit Breakers: UL 943 and NFPA 70. [GFCI](#) breaker shall be able to detect and trip on current imbalance of 5 milliamperes or greater per requirements of UL 943 for personal protection and 20 milliamperes or greater per requirements of UL 943 for equipment protection.

Branch Circuit Breakers in Distribution Panelboards: Where OCPP's are indicated to be circuit breakers, use bolt-on breakers except circuit breakers [of](#) 225 ampere frame size and greater may be plug-in type where individual positive locking device requires mechanical release for removal.

RESTRICTIONS

- Not applicable.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 16442, Panelboards. (Future)*

AGENCY CONTACT - Electrical Engineering Division - (202) 226-3470.

D5017 - MOTOR CONTROL CENTERS

DESIGN REQUIREMENTS

Type: 3 phase, 4 wire type.

Equipment Ground Bus: Non-insulated, copper, half size ground bus.

Neutral Bus: Full-size, copper.

Expansion: Provide for future expansion. Provide one additional set of auxiliary contacts in each starter unit.

Control Wiring: Class II, Type B wiring.

Mounting: Mount on 4" high concrete pad.

RESTRICTIONS

- Do not use switch and fuse type.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 16443, Motor Control Centers (future)*

AGENCY CONTACT - AOC, Electrical Engineering Division - (202) 226-3470.

D502 - LIGHTING & BRANCH WIRING

DESIGN REQUIREMENTS

General: General wiring devices shall be specification grade. The building standard receptacle is duplex, specification grade NEMA 5-20R. Cover plates shall be metal. Color receptacles as follows:

- **Emergency receptacles:** Red.
- **Isolated grounding receptacles:** Orange.
- **Special purpose receptacles:** Brown.
- **Standard receptacles:** Coordinate with architectural scheme - white (not ivory) for white or light grey walls.

Placement of Receptacles:

- **Office Space:** Receptacles for housekeeping should be placed in exterior walls and walls around permanent cores or corridors, or in permanent bearing walls. Except for these instances, avoid placement of receptacles in standard office gypsum drywall partitions to the extent possible within NEC requirements. For initial planning purposes, assume that office space uses furniture with a density of two workstations for every 100 sq. ft. (9 m²). Electrical systems should be designed to allow two duplex outlets for electronic equipment power and two duplex outlets for normal power per workstation.
 - **Raised Access Floor:** Route all wiring beneath a raised access floor in metal conduit or cable to underfloor distribution boxes. Attach flush-mounted access floor service boxes to the underfloor distribution boxes by means of a plug-in modular wiring system to facilitate easy relocation.
 - **Cellular Floor Duct and Floor Duct Encased in Concrete:** When cellular floor duct systems are used, the distance between horizontal duct runs is 6 feet (1.8 m). Locate presets every 2 feet (600 mm) along each run.
- **Corridors:** Locate receptacles 50 feet (15 m) on center and no more than 25 feet (7.5 m) from corridor ends.
- **Conference Rooms:** Serve in manner similar to general office space. Ensure that an adequate number of receptacles are provided to support audio/visual devices and computer connections.
- **Maintenance Shops:** Provide plugmold strips above work benches with outlets 18" on center.
- **Toilet Rooms:** Provide each toilet room with one **GFCI** receptacle at vanity or sinks and an additional GFI receptacle located for housekeeping purposes.
- **Electrical and Communication Closets:** Provide one double duplex emergency power receptacle in each electrical closet on a separate circuit. Telecommunications closets will require power and grounding for the passive and active devices used for the telecommunications systems, including at least two dedicated 20A, 120 Volt duplex electrical outlets on emergency power, and additional

convenience outlets at 6 ft. (1.8 m) intervals around the walls and direct connection to the main building grounding system. If UPS is required in communication closets, it will be furnished as part of the communications system.

- **Main Mechanical and Electrical Rooms:** Each should have at least one emergency power receptacle.
- **Exterior Mechanical Equipment:** Provide one waterproof [GFCI](#) receptacle adjacent to mechanical equipment exterior to the building and on the roof.
- **Stairs:** One per landing in each stairtower or stair enclosure.
- **Cashier Stands:** Provide duplex receptacle.

RESTRICTIONS

- Not applicable.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 16120, Conductors and Cables. (Future)*
- *AOC Guide Specification - Section 16138, Underfloor Raceways. (Future)*

AGENCY CONTACT - Ms. Annette Kim, PE - (202) 226-3471

D5021 - ELECTRICAL BRANCH WIRING

DESIGN REQUIREMENTS

Wire and Cable: Sizes and ampacities based on copper . Minimum size wiring for all branch circuits shall be #12 AWG.

- **Wire and Cable 600V and Below:** Type THWN/THHN conforming to UL 83.
- **Minimum Conduit Size:** 3/4"
- **Conductors:** Soft-annealed copper. Conductors No. 10 AWG and smaller shall be solid, and No. 8 AWG and larger shall be stranded.
- **Insulation:** Cross-linked thermosetting polyethylene, flame retardant, and moisture resistant.

Outlet Boxes and Covers: UL 514A, cadmium- or zinc-coated, if ferrous metal. UL 514C, if nonmetallic.

- **Outlet Boxes in Hazardous (Classified) Locations:** UL 886.

Cabinets, Junction Boxes, and Pull Boxes: UL 50, hot-dip, zinc-coated, if steel sheet.

Floor Outlet Boxes: Boxes shall be adjustable and concrete tight. Each outlet shall consist of nonmetallic or cast body with threaded openings, or sheet-steel body with knockouts for conduits, adjustable ring, brass flange ring, and cover plate with threaded plug.

- **Receptacle Outlets:** Aluminum or stainless steel housing with duplex-type receptacle. Provide gaskets where necessary to ensure watertight installation.

Computers and Solid State Devices: The increased use of solid state devices, including the use of PC's and printers in office area requires careful planning and connection to the existing electrical system. To avoid poor performance of the equipment and to minimize downtime, the following guidelines should be observed:

- **PC Circuits:** Provide a separate branch circuit with dedicated neutral and common ground for each circuit serving PC's and each printer. Minimum wire size shall be #12 copper served from a 20A breaker. Signify receptacles on these circuits with "orange" plugs.
- Provide separate circuit for printer.
- Connect no more than 2-3 PC's on each circuit. Connect no more than 5-6 duplex receptacles on each circuit.
- Do not connect any other equipment such as fans, heaters, coffee pots, microwaves on the same circuit serving PC's and printers.

RESTRICTIONS

- Do not use aluminum conductors or cables under any conditions.
- Do not use Romex, or BX cable.
- Do not use Type AL, NM, or UF cables.
- Do not use Type ENT raceways.
- Do not run emergency circuits in the same raceway as normal circuits.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 16120, Conductors and Cables. (Future)*
- *AOC Guide Specification - Section 16122, Undercarpet Cables. (Future)*

AGENCY CONTACT - Ms. Annette Kim, PE - (202) 226-3471

D5021.1 - UNDERFLOOR DUCTS

DESIGN REQUIREMENTS

General: provide separate ducts for the following services:

- Telephone/communication.
- Power.
- Fire Alarm and security system.
- Spare for future signal.

Junction Boxes: Size junction boxes to accommodate the various sizes and number of ducts. Junction boxes shall have partitions to isolate the various services, and shall afford access to each compartment through a single handhole.

Ground Continuity: Wherever concrete floor cells or plastic insulating sections are used in the system, the terminating metallic sections shall be externally bonded by a braided ground tie equivalent to a number 8 AWG copper wire.

RESTRICTIONS

- Not applicable.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 16136, Underfloor Raceways (Future)*

AGENCY CONTACT - Electrical Engineering Division - (202) 226-3471.

D5022 - INTERIOR LIGHTING

DESIGN REQUIREMENTS

General: Generally, interior lighting should be fluorescent. Downlights should be compact fluorescent. High bay lighting should be high intensity discharge (HID). HID should not be used in spaces where instantaneous control is important, such as conference rooms, auditoria or hearing rooms.

- **Lighting Design Standard:** *Illuminating Engineering Society Handbook, 2000 Edition.*
- **Dimming:** Accomplish with incandescent, fluorescent or HID fixtures, although HID and fluorescent dimmers should not be used where harmonics constitute a problem. Use incandescent lighting sparingly.
- **Circuit Loads:** 120V circuit - Maximum 1400 watts.
- **Circuit Loads:** 277V circuit - Maximum 3200 watts.
- **Fixture Schedule:** Provide a fixture schedule for each project. Show 3 equivalent fixture models with manufacturer's name and model number for each fixture type to be utilized on the project.

Lighting Criteria for Building Spaces

- **Office Criteria:** Generally, provide fluorescent lighting with even level of illumination. To facilitate changes, use modular (plug-in) wiring for fluorescent fixtures. In open plan areas with systems partitions, reduce the coefficient of utilization to account for light obstruction and partition absorption. Task lighting will be used in situations such as areas of systems furniture where the general lighting level may be insufficient for the task surfaces involved.
- **ADP Areas:** Generally, employ lighting similar to that used for office areas. If the area contains special work stations for computer graphics, dimmable incandescent lighting may be required. If large ADP area is segregated into areas of high and low personnel activity, switching should be used when areas are not being utilized.
- **Conference and Training Rooms:** Provide a combination of fluorescent and incandescent lighting. In rooms of 200 sq. ft. or more, always circuit fixtures across two or more circuits that roughly divide the lighting areas in half to facilitate dimmed areas for visual projections.
- **Public Corridors, Lobbies, Atria and Tunnels:** Special lighting concepts are encouraged in these spaces. The lighting design should be integral to the architectural concept. Consideration may be given to wall fixtures or combination wall and ceiling fixtures in corridors and tunnels to relieve the monotony of a long, plain space.
- **Mechanical and Electrical Spaces:** Equip these spaces with industrial type fluorescent fixtures. Locate fixtures to prevent obstruction by tall or suspended equipment.
- **Dining Areas, Cafeterias, and Serveries:** Ample daylight is the illumination choice in dining areas, assisted by fluorescent flares. Limited incandescent lighting for accents is acceptable.
- **Supplemental Emergency Lighting:** Provide partial emergency lighting in main mechanical, electrical, and communication rooms; in UPS, battery, and ADP rooms; in security and fire control centers; and

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in the room where the Building Automation System is located. Provide emergency lighting at the task area where CCTV cameras are used for security systems.

- **Structured Parking:** Parking area fixtures may be fluorescent strip fixtures with wire guards or diffusers. Locate fixtures to preserve vehicle clearances. Consider HID or enclosed fluorescent fixtures for above-grade parking structures.
- **High Bay Lighting:** Shop, supply, or warehouse with ceilings above 16 ft. should use color improved high pressure sodium lighting. In areas where color rendition is known to be of particular importance (paint or wood finishing shops, etc.), metal halide should be used.
- **Illumination Levels:** For lighting levels for interior spaces, use the values indicated in the following:

INTERIOR ILLUMINATION LEVELS	
Area	Nominal Illumination Level in Foot Candles
OFFICE SPACES	
Normal work station space, open or closed offices (1)	50
Conference Rooms	30
Training Rooms	50
Internal Corridors	20
Hearing & Committee Rooms, Auditoria	30
PUBLIC AREAS	
Public Corridors, Entrance & Elevator Lobbies, Atria	20
Stairwells	20
Pedestrian Tunnels and Subway Tunnels/Terminals	20
SUPPORT SPACES	
Toilets and Restrooms, Staff Locker Rooms	20
Storage Rooms, Janitor's Closets	20
Electrical Rooms, Mechanical Rooms, Generators	20
Communication Room	20
Maintenance Shops	50
Loading Docks and Trash Rooms	20
SPECIALTY AREAS	
Dining Areas, Cafeterias, and Serveries	30
Kitchens	50
Physical Fitness Space	50
Child Care Centers	50
Parking Structures (Garages), General Area	5
Parking Structures (Garages), Entrances	10

- (1) Level assumes a combination of task and ceiling lighting where systems furniture is used. In office areas with system furniture, assume that under-cabinet task lighting is used and provide general illumination of about 300 FC on the work surface.

General Lighting Fixture Criteria

- **General Features:** Provide fixtures of standard, commercial design. Avoid custom fixtures without written approval of the AOC.
 - Limit the number of fixture types in a given building.
 - In alterations of existing facilities, attempt to match existing standard fixtures as practicable.
 - Lamp phosphors shall be a composition which includes rare earth phosphors, with corrected color temperature (CCT) of 4,100 deg. Kelvin and a color rendering index (CRI) of not less than 70 CRI for garages, tunnels, and subways. CCT of 3,500 deg. Kelvin and CRI of not less than 82 for offices.
 - Use Parabolic type (low brightness) for offices.
- **Energy Efficient Design:** Lighting design shall comply with ASHRAE/IES. Lighting calculations should show the effect of both general and task lighting assuming that task lighting where it is used has compact fluorescent tubes. Use fixtures with T8 fluorescent lamps and hybrid ballasts in areas with legislative clock system. T8 fluorescent lamps and electronic ballasts also can be used in areas where the legislative clock system is not installed.
- **Motion Sensors:** Consider the use of motion sensors to control the fixtures in individual offices and other areas. Indicate in initial design submission, the location and type of sensors proposed.
- **Baseline Building Fixture:** The fixture to be used for baseline cost comparisons for office space is a 2 x 2 (600 mm x 600 mm) fixture utilizing T-8 or CFL lamps and electronic ballasts.
- **Fixture Ballasts:** Provide a sound rating of “A” for offices, conference rooms, and committee rooms. A “B” sound rating is acceptable for corridors or parking garages. Ballasts should have harmonics of 10% or less.

RESTRICTIONS

- Minimize use of incandescent lamps.
- Use motion control switches to control fixtures in public restrooms.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 16510, Interior Lighting. (Future)*

AGENCY CONTACT - Ms. Annette Kim, PE - (202) 226-3470.

D503 - COMMUNICATION & SECURITY SYSTEMS

DESIGN REQUIREMENTS

General: Many different types of communication systems are utilized throughout the Congressional Complex. Each system has different requirements. The Associate A/E shall coordinate power and raceway requirements to meet the scope required. Systems in use include:

- Legislative Call System.
- Telecommunication Systems.
- Radio/TV Systems (CATV).
- Security Systems.
- Sound Reinforcement Systems.
- Cashier Stand: Provide telecommunication and security conduits (minimum 1" EC).

RESTRICTIONS

- Minimum 1-1/2" EC for security system when used as part of street lighting.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 16722, Intercommunication Equipment (Future).*

AGENCY CONTACT - Mr. Robert Hoyler - (202) 224-9827

D5030 - POWER FOR AUDIO AND LEGISLATIVE CALL SYSTEMS

DESIGN REQUIREMENTS

Legislative Clocks: The Legislative Call electronic signal system in the building consists of a power-line carrier current system. There are currently more than 7,000 clocks in the system. The purpose of the power-line carrier current system is to transmit signals by timing and duration of high frequency pulses. The high frequency pulses are superimposed upon the building's power distribution system. The receivers are powered at 120 volts A.C.

- The Audio and Legislative Call System presents to the user in one of several formats: clocks, clocks with buzzer systems, clocks with light bars, or variations thereof.
- Provide legislative clock outlets in rooms as directed by the Electronics Engineering Division.
- The signal frequencies for the Senate Clocks are centered about 2633, 3510, and 4200 Hertz, and have a bandwidth of 200 Hertz.
- The signal frequencies for the House Clocks are centered about 5850, 7020, and 8775 Hertz, and have a bandwidth of 200 Hertz.
- The signal frequencies for the Library of Congress Clocks are centered about 6300 Hertz, and have a bandwidth of 200 Hertz.
- The signal frequencies for the Supreme Court Clocks are centered about 5010 and 7300 Hertz, and have a bandwidth of 200 Hertz.
- The amplitude of the Legislative Call System electronic signal throughout the power distribution system is generally less than 1.5 volts.

Power: Provide 120 volt power to the Audio and Legislative Call System junction boxes/back boxes. Provide 120 volt clock outlet recessed in junction boxes.

Interferences: SCR drives, VFD, electronic ballasts, harmonic-attenuating transformers, etc. may impact the clock signal system. Provide isolation transformers, line filters, etc., as required.

RESTRICTIONS

- None.

RELATED DOCUMENTS

- *Low Voltage Switchgear (Future)*

AGENCY CONTACT - AOC, Electronics Engineering Division - (202) 224-9827.

D5031 - FIRE ALARM SYSTEMS

DESIGN REQUIREMENTS

General: Provide a fire alarm system throughout all new construction projects and in all major renovation projects. Specific requirements are as follows:

- **Audible Notification:** All new fire alarm systems shall be provided with a voice evacuation system.
- **Visible Notification:** All new fire alarm systems shall be provided with a visible notification system.
- **Manual Initiation:** Manual fire alarm stations shall be provided for all fire alarm systems. Exceptions for automatic initiation do not apply.
- **Automation Initiation:** Smoke detectors, heat detectors, flow switches, duct detectors, and other automatic initiation devices shall be provided for all projects.
- **Sequence of Operations:** All sequence of operations shall be in accordance with applicable codes. Any deviations shall be approved under "Variance" procedures. Typical variance includes pre-signal operation of smoke detectors.
- **Stand-alone Systems:** "Fire alarm systems shall not be integrated with other building systems such as building automation, energy management, security, etc. Fire alarm systems shall be self-contained, stand-alone systems able to function independently of other building systems." GSA

Standards for Fire Alarm Design: The standards listed below will be used by AOC staff as the basis for design reviews and approvals.

- **International Code Council (ICC):** *International Building Code (IBC)*, 2003.
- **National Fire Protection Association (NFPA):** *National Fire Alarm Code*, NFPA 72-99.
- **National Fire Protection Association (NFPA):** *Installation of Sprinkler Systems*, NFPA 13-99.
- **International Code Council (ICC):** *International Mechanical Code (IMC)*, 2003.

Manual Fire Alarm Systems: Manual fire alarm stations shall be double-action and installed in every facility in accordance with the requirements of NFPA 72 and the International Building Code.

Suppression System Interfaces: Fire alarm system shall monitor all suppression system supervisory and alarm conditions with individual "points;" including, but not limited to water flow switches, tamper switches, fire pumps, kitchen suppression systems, and gaseous suppression systems.

Smoke Detectors: Place and space in accordance with the *International Building Code*, NFPA 72, *International Mechanical Code*, and the following:

- All smoke detectors connected to new addressable fire alarm systems shall be addressable.
- No more than 25 conventional smoke detectors nor more than six rooms shall comprise any one smoke detection zone.
- In buildings without complete automatic sprinkler protection, full smoke detection shall be provided.

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- In buildings with complete automatic sprinkler protection, smoke detector coverage shall be in accordance with the *International Building Code* and the *International Mechanical Code*. Note that careful consideration of sequence of operation variances for fire alarm system is required.

Audible Notification Appliances: Place and space in accordance with NFPA 72 and the following:

- “To ensure audible signals are clearly heard, the sound level shall be at least 70 dBA throughout the office space, general building areas and corridors measured 5 feet above the floor. The sound level in other areas shall be at least 15 dBA above the average sound level or 5 dBA above any noise source lasting 60 seconds.
- Where voice communication systems are provided, fire alarm speakers shall be installed in elevator cabs and exit stairways; however they shall only be activated to broadcast live voice messages (e.g., manual announcements only). The automatic voice messages shall be broadcast through the fire alarm speakers on the appropriate floors, but not in stairs or elevator cabs.”^{GSA}
- All new emergency voice systems shall meet intelligibility requirements of NFPA 72, Appendix A.

Visible Notification: Place and space in accordance with NFPA 72 and the following:

- “Visual notification appliances shall only be required to be installed in public and common areas. For the purposes of this requirement, visual notification appliances shall not be required to be installed in individual offices. Public and common areas include public rest rooms, reception areas, building core areas, conference rooms, open office areas, etc.
- Visual notification appliances shall not be installed in exit enclosures (i.e., exit stairs, etc.).”^{GSA}
- Visual notification appliances installed in high-noise areas shall be spaced in accordance with NFPA 72.

Graphic Annunciator: Provide at least one graphic annunciator(s) located at the entrance designated by the AOC Fire Protection Engineering Branch and as designated by the United States Capitol Police.

Survivability: “The requirements below are in addition to the survivability requirements specified in NFPA 72 and the International Electrical Code.

- “At least two vertical risers shall be installed as remote as possible from each other. A minimum two-hour fire rated assembly, shaft, or enclosure, not common to both risers shall protect one riser. A minimum one-hour fire rated assembly, shaft, or enclosure shall protect the second riser. A minimum one-hour fire rated assembly, shaft, or enclosure shall protect the horizontal interconnection between the two risers.
- A minimum of two (2) distinct fire alarm audible appliance circuits and a minimum of two (2) distinct visual appliance circuits shall be provided on each floor.
- Adjacent fire alarm audible and visual appliances shall be on separate circuits.”^{GSA}

Circuit Classifications: All SLC risers shall be Style 7. Any single fault shall not impair more than one-half of a single floor. Class B zoned circuits are permitted.

RESTRICTIONS

- ***Control Functions:*** Control functions shall occur through software whenever possible. For example, avoid AHU shutdown via auxiliary duct detector contacts.
- ***Battery Loads:*** Battery back-up shall be calculated per NFPA 72 at not greater than 80% actual battery capacity.
- ***Circuit Loads:*** Each new fire alarm circuit shall include 20% spare capacity.
- ***Mechanical Protection:*** All new fire alarm circuits shall be installed within electrical metallic tubing (EMT) or rigid conduit.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 13851, Fire Alarm.*

AGENCY CONTACT - Mr. John Williams, PE - (202) 226-2645

D5035 - CABLE TELEVISION SYSTEMS - RACEWAYS

DESIGN REQUIREMENTS

Raceway system: A raceway system and associated junction boxes shall be provided for the AOC Cable Television System.

Conduit/junction box sizes: Provide oversized/deep junction box (11-B) and minimum 1" metallic conduits. Provide single gang device ring on junction box. Cable TV wiring, device and device covers will be provided by the Government.

Locations: Provide AOC Cable Television System outlets where directed by the Electronics Engineering Division.

RESTRICTIONS

- [None.](#)

RELATED DOCUMENTS

- *AOC Guide Specification - Section 16130, Raceways and Boxes (Future).*

AGENCY CONTACT - AOC, Electronics Engineering Division - (202) 224-9827

D5040.1 - BIRD CONTROL SYSTEM

DESIGN REQUIREMENTS

Systems: Several varieties of bird proofing systems are used within the Capitol Complex. Electric device and netting systems are primarily used.

Electric devices: Provide electric devices using low amp, high volt wiring systems that repel birds with a pulsating shock. Repelling chargers shall be listed by a nationally recognized testing laboratory. When designing extensions to existing bird proofing systems, contact individual building superintendents for existing manufacturer/model number of charger equipment used. Electric chargers shall have electric power cords appropriate to plug into new [GFCI](#) outlets located near chargers.

Netting: Weatherproof, inconspicuous, fire retardant and UV protected polyethylene netting which inhibit roosting or breeding of birds. Color to be determined by application. Use stainless steel permanent mounting cable and hardware.

Mechanical barriers: Stainless steel or plastic spike or coil configurations.

Post and wire: Thin nylon-coated stainless steel wire spring-tensioned to narrow posts.

RESTRICTIONS

- Do not use chemical repellents or toxic baiting systems.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 16050, Basic Electrical Materials and Methods. (Future)*
- *AOC Guide Specification - Section 16130, Raceways and Boxes. (Future)*

AGENCY CONTACT - AOC, Electrical Engineering Division - (202) 226-3470.

D5041 - UNINTERRUPTIBLE POWER SUPPLY

DESIGN REQUIREMENTS

Where Required: The nature, size, and locations of critical loads to be supplied by the UPS will be provided in the program. The UPS system shall serve critical loads only.

Solid State Design: UPS shall be solid state with an input filter or transformer to protect both the UPS and downstream equipment when in bypass. Provide bypass switch to facilitate maintenance. Provide UPS with an isolation transformer. Provide 3 separate services: one to the UPS rectifier circuit, one to the inverter bypass circuit, and one to a maintenance bypass circuit.

Output Characteristics:

- ***Voltage Characteristics:*** 1.0 %.
- ***No load voltage Modulation:*** Plus or minus 1 %.
- ***Voltage Adjustment:*** Plus or minus 5 % manually.
- ***Frequency Regulation:*** Plus or minus 0.1 %.
- ***Harmonic Content (RMS Voltage):*** 3 % single harmonic maximum.
- ***Load Power Factor Operating Range:*** 1.0 to 0.8 lagging.
- ***Overload Capability:*** 125 % for 10 minutes, 150 % for 30 minutes.

Hot Swap Batteries: Provide for replacement of batteries without having to power off the UPS unit. Provide lead calcium batteries which do not require additional ventilation. Provide 20-year life batteries.

Capacity: Size UPS system to meet anticipated design load with an additional 25% spare capacity.

Emergency Electrical Power Source Requirements: When UPS is running on emergency power, the current to recharge the UPS batteries should be limited. This limited battery charging load should be added when sizing the emergency generator.

System Status and Control Panel: Provide all instruments and controls for proper system operation. System status panel should have an appropriate audio/visual alarms, with associated alarm silencer button. Include the following functions: system on, system bypassed, system fault, out of phase utility fault, closed generator circuit breaker. Provide an additional remote system status panel and alarm annunciation in space serviced by the UPS.

UPS and Battery Room Requirements: Design battery room in accordance with NEC Article 480. Provide emergency lighting in both UPS and battery rooms. Provide a telephone in or adjacent to the UPS room. Provide acoustical treatment of UPS room to reduce noise levels.

Battery Racks: Provide 20-year life batteries. Provide two-tier racks with bracing and connections to match seismic conditions of the site.

Failure of AC power to Return: Should AC power fail to return before battery voltage reaches the discharge limit, the UPS system shall disconnect from the critical load to safeguard the battery,

RESTRICTIONS

- None.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 16264, Static Uninterruptible Power Supply (Future)*

AGENCY CONTACT - Ms. Annette Kim, PE - (202) 226-3471

D5042 - EMERGENCY POWER SYSTEMS

DESIGN REQUIREMENTS

General: Provide emergency power for life safety for all facilities as required by Code.

Batteries: Self-contained battery units may be used for individual light fixtures in buildings where an emergency generator is not required (or available). When batteries are the sole source of emergency power to supply lighting, they should be capable of supplying emergency power for a minimum of 1.5 hours. Do not use battery units for new buildings without written approval of the AOC.

Generator Systems: Design emergency generators in accordance with NFPA 110, *Emergency and Standby Power Systems*. Provide system consisting of a central engine generator and a separate distribution system with automatic transfer switch(es), distribution panels, and 480/277 lighting panel (if applicable) with dry-type transformers feeding 208/120 V panels as required.

- **Radio Interference:** Locate generators at least 100 feet (30 m) from communication equipment to avoid radio interference.
- **Radiators:** Unit mounted radiators are preferred. If ventilation is restricted in indoor applications, consider remote installations.
- **Capacity:** Size generator to approximately 125% of design load. Size generator considering the inrush load of all motors that are automatically started simultaneously. Initial voltage drop on generator output due to starting currents of loads shall not exceed 15%. Consider non-linear loads in sizing the generator.
- **Fuel Capacity:** Provide fuel tank capacity to support operation for 24 hours.
- **Mufflers:** Provide Hospital Grade (Low noise type).
- **Alarms:** Provide remote alarm annunciator and load-bank connection testing cabinet.
- **Exterior Generators:** Provide with weatherproof enclosure with provision for cold-weather starting (such as coolant jacket heaters).
- **Automatic Transfer Switches:** Provide separate automatic transfer switches for life safety, elevators, and other systems. ATS systems serving motor loads should be dual motor-operated (adjustable time delay neutral position), or have in-phase monitor (transfer when normal and emergency voltages are in-phase) to reduce possible motor damage caused by out-of-phase transfer.
 - **Ground Fault Systems:** To reduce nuisance-tripping of ground fault relays, automatic transfer switches serving 3-phase, 4-wire loads should have 4-pole contacts with an overlapping neutral.
 - **Bypass Isolation:** Provide bypass isolation switch that allows manual bypass of the normal or emergency source to ensure continued power to emergency circuits in the event of switch failure or required maintenance.

Paralleling: For large loads with multiple generators, generator paralleling should be considered.

Emergency Power Loads: Provide emergency for the following functions:

- Egress and exit lighting.
- Fire Alarm System.
- Generator auxiliaries.
- Smoke control systems (if required by Code).
- Telephone switch.
- Security systems.
- Mechanical control systems.
- Building Automation System.
- Elevators (one per bank).
- Sump pumps.
- Sewage ejector pumps.
- Exhaust fans removing toxic, explosive or flammable fumes.
- Uninterruptible power systems serving computer rooms (as applicable).
- Air Conditioning systems for computer and UPS rooms (as applicable).
- Exhaust fans for UPS rooms (as applicable).
- Power and Lighting for Fire Control Center and Security Control Center. (Operations Centers?)
- Lighting for main electrical room, electrical closets, and communications closets.
- One light fixture in each public restroom.
- Minimum of one clearly labeled duplex receptacle in switchgear and generator rooms.
- Air conditioning systems serving communications closets (as applicable).

RESTRICTIONS

- ***Auto-Exercise:*** Emergency generator shall not have auto-exercise.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 16231, Packaged Engine Generators. (Future)*

AGENCY CONTACT - Ms. Annette Kim, PE - (202) 226-3471

D5046 - LIGHTNING PROTECTION SYSTEMS

DESIGN REQUIREMENTS

General: Design system in compliance with the Master Label provisions of UL 96A, "Installation Requirements for Lightning Protection Components" and UL 96, "Lightning Protection Components." Final resistance-to-ground shall be 5 ohms or less. Design system to be as inconspicuous as possible. Conceal conductors within the building or behind roof parapets, except for those conductors that must be run on the roof surface. Primary and secondary conductors to devices and equipment on the roof may be run exposed. Tilt air terminals toward the inside of the building and mounted in a hidden manner. Comply with NFPA 780 pertaining to lightning arrestors, grounding, grounding electrodes, and down conductor clearances.

Conductors: For copper roofs, provide bare standard copper cable, 28 strands of 14 gauge, 115,000 cm, 375 pounds per thousand feet. For aluminum roofs, all conductors shall be bare standard aluminum cable, 37 strands of 13 gauge, 192,000 cm, 190 pounds per thousand feet.

Air Terminals: Extend at least 10" above the object that they are to protect. Fabricate air terminals of solid copper, 1/2" min. dia. for copper roofs or 5/8" dia. solid aluminum with tapered points for aluminum roofs.

Fasteners, Clamps, & Connectors: Fabricate of same materials as the conductors or of materials not subject to catalytic action in the presence of moisture.

Ground Rods: Provide ground rods 3/4" diameter by 10' long made of copper-clad steel. Drive all ground rods to a minimum depth of 12' below finished grade or finished floor.

Surge Suppression: Provide labeled and listed devices suitable for protection of the structure on electric and telephone service entrances and on radio and television lead-ins.

Ground Test Stations: Provide test stations 12" in diameter by 24" deep, constructed of PVC materials with cast iron covers. Ground test stations in locations subject to vehicular traffic (including riding lawn mowers), shall have an appropriate AASHTO standard/rating associated with them.

RESTRICTIONS

- Do not expose conductors if possible.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 16670, Lightning Protection Systems.*
- *ANSI Compliance: Comply with applicable requirements of ANSI C2.*

AGENCY CONTACT - Ms. Annette Kim, PE - (202) 226-3471

D505 - ELECTRICAL CONTROLS - INTEGRATED MONITORING

DESIGN REQUIREMENTS

Integrated Monitoring System: Equip all newly-installed power distribution equipment with a complete monitoring system capable of providing positive two-way, real time communication with two remote computers via the existing Ethernet network. Provide for high and low voltage switchgear, power transformers, network protectors and emergency generators.

Existing System: Currently, the majority of buildings within the Congressional Complex are covered by an operating power distribution monitoring system IMPACC by Cutler Hammer. It utilizes Ethernet communication network, Windows NT, PowerNet software by Cutler Hammer and Factory Suite 2000 software by Wonderware Corp.

- PowerNet software provides data display and alarms on two remote computers in a tabulated format.
- Factory Suite software provides data display and alarms on two remote computers in graphics.

Special Requirements: The vendor of new power distribution equipment shall provide all necessary software, licences and hardware to interface the existing IMPACC monitoring network and to display data on the remote existing master and auxiliary computers.

- At a minimum, match the existing operating IMPACC system in the graphical part of the data display. The new system shall be fully compatible with WonderWare 7.0, including NetDDE module, and using TCP-IP (Ethernet) protocol. Graphical data shall match the existing display format (single lines, front views, annunciators).
- Data display of new equipment in a tabulated format could be accomplished by running a new system software concurrently with the PowerNet software.
- The vendor shall provide advanced detailed information how a seamless interface with the existing system is to be accomplished, provide references or demonstrate actually operating system with output in WonderWare format.

Specific Requirements: Switchgear and emergency generator monitoring systems shall include metering devices at each circuit breaker and each incoming line. Included in the package should be a suitable computer (local monitoring computer) with peripherals to serve as an interface between local monitoring network and the Ethernet network.

Monitor: Monitor power transformers (transformer vaults) and automatic transfer switches by addressable relay or by a programmable logic controller (PLC) to indicate the status (open/closed) of discrete contacts. Integrate the output into the monitoring system with display on a remote computer. Mount the relays or LPC in an enclosure and wired to a terminal block.

RESTRICTIONS

- Not applicable.

RELATED DOCUMENTS

- *AOC Guide Specification: Future*

AGENCY CONTACT - AOC, Electrical Engineering Division - (202) 226-3470

PART E - EQUIPMENT & FURNISHINGS

E000 INTRODUCTION

E100 EQUIPMENT

- 101 Commercial Equipment - *Security & vault, & office equipment.*
- 102 Misc. Institutional Equipment - *Library, theater & stage, & detention,*
- 103 Vehicular Equipment - *Parking control & loading dock.*
- 104 Other Equipment - *Maintenance, solid waste, & food service.*

E200 FURNISHINGS

- 201 Fixed Furnishings - *Fixed artwork, casework, window treatment, floor grilles, fixed seating, & fixed interior landscaping.*
- 202 Movable Furnishings - *(Future)*

E2012 - FIXED CASEWORK

DESIGN REQUIREMENTS

Rostrums, Committee/Hearing Room Furnishings: Provide AWI “Premium” grade for finish and construction.

- **Paneling, Transparent Finish:** Provide AWI “Premium” grade lumber, veneers, and finishes.
- **Paneling, Opaque Finish:** Provide AWI “Custom” grade substrates and “Premium” finishes.

Staff Casework: For casework subject to extensive public use, such as corridor security or information desks in Principal buildings, provide AWI “Premium” grade. Fabricate countertops with plastic laminate finishes. Do not face work surfaces or countertops with applied “tape” veneers.

Support Casework: Provide AWI “Custom” grade cabinets, counters and work surfaces in staff workrooms. Countertops shall always have laminate tops overlap counter edging. Do not use “post-formed” laminate countertops [except in Service or temporary construction](#).

Solid Surface Countertops: Provide solid surface or granite countertops in public restrooms.

Veneer and Plastic Laminate Substrates: For fully supported panels, the AOC prefers Medium Density Fiberboard with “Exterior Glue.”

Transparent Finishes - Vertical Woodwork: Water-reducible lacquers and urethanes are preferred for vertical transparent finishes because of ease of repair, low fume production, and lack of yellowing. Back-prime all woodwork.

Temporary Installations: For “swing spaces” and temporary buildings, utilize commercially available casework fabricated to ANSI/KCMA A161.1 standards. Provide “post-formed” laminate countertops.

RESTRICTIONS

- Do not over-specify casework for office use.
- Particleboard: Do not use particleboard containing formaldehyde resins.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 06410, Architectural Woodwork. (Future)*

AGENCY CONTACT - Technical Support Division - Mr. John Weber - (202) 225-5900.

PART F - OTHER BUILDING CONSTRUCTION

F000	INTRODUCTION
F100	SPECIAL CONSTRUCTION
101	Special Structures - <i>Pre-engineering buildings, glazed structures, grandstands</i>
102	Integrated Construction - <i>Integrated ceilings, special purpose rooms</i>
103	Special Construction Systems - <i>Sound, vibration & seismic, special security systems</i>
104	Special Facilities - <i>Kennels</i>
105	Special Controls & Instrumentation - <i>Building automation systems, fire suppression & supervisory systems</i>
F200	SELECTIVE DEMOLITION
201	Building Elements Demolition - <i>Minor demolition in Remodeling, selective structural</i>
202	Hazardous Components Abatement - <i>Asbestos, lead, etc.</i>

PART G - BUILDING SITEWORK

G000 INTRODUCTION

G100 SITE PREPARATION

- 101 Subsurface Investigation - *Penetration tests & seismic (Future)*
- 102 Site Clearing - *Sod stripping, clearing & grubbing, shrub & tree removal (Future)*
- 103 Site Demolition & Relocation - *Building & site elements demolition.*
- 104 Site Earthwork - *Grading, excavating, backfilling, & compacting, soil stabilization.*

G200 SITE IMPROVEMENTS

- 201 Roadways - *Base courses, roadway unit pavers, curb & gutters, & appurtenances.*
- 202 Parking Lots - *Base courses, parking lot unit pavers, curbs & gutters, & appurtenances.*
- 203 Pedestrian Paving - *Base courses, flexible pavement, unit pavers, rigid, & exterior steps.*
- 204 Site Development - *Fountains, fences & gates, site furnishings, signs, flagpoles, & covers.*
- 205 Landscaping - *Irrigation systems, lawns & grasses, trees, plants & ground covers.*

G300 SITE PLUMBING IMPROVEMENTS

- 301 Site Water Supply & Distribution Systems - *(Future)*
- 302 Site Sanitary Sewer Systems - *(Future)*
- 303 Site Storm Sewer Systems - *(Future)*
- 304 Site Fuel Distribution Systems - *(Future)*
- 305 Site Special Plumbing Systems

G400 SITE HVAC

- 401 Site Steam Distribution Systems - *Site steam piping systems*
- 402 Site Hydronic Distribution Systems - *Site hydronic piping systems*

G500 SITE ELECTRICAL UTILITIES

- 501 Site Electrical Distribution - *Substations, power distribution, & distribution equipment.*
- 502 Site Lighting Systems - *Area systems, security lighting, & other.*
- 503 Site Communications & Security Systems - *Site alarm & detection, site voice/data. Etc.*
- 504 Other Site Electrical Utilities - *Cathodic protection systems*

G600 OTHER SITE CONSTRUCTION

- 601 Service Tunnels
- 602 Other Site Systems & Equipment

G201 - ROADWAYS

DESIGN REQUIREMENTS

General: Provide paving conforming to the following:

- ***Principal Streets and Secondary:*** Conform with District of Columbia Department of Highways and Traffic, “Standard Specifications for Highways and Structures” (DHSS). For re-paving applications, remove approximately 1-1/2" of existing bituminous concrete paving before applying new wearing course.

Brick Gutters: Many Capitol Complex streets have existing brick gutters. Ensure that they are protected/restored as applicable.

- ***Parking Lots and Drives:*** In addition to the standards referenced above, comply with applicable provisions of the Americans with Disabilities Act (ADA).
- ***Curbs:*** For streets adjoining *Principal* buildings, use granite curbs. For streets adjoining *Support* and *Service* buildings on the Capitol Complex provide concrete curbs complying with DHSS standards or match existing conditions.

RESTRICTIONS

- Do not use DHSS provisions referring to basis of payment.

RELATED DOCUMENTS

- AOC Guide Specification - Section 02511, Bituminous Concrete for Street Paving.
- *AOC Standard Details - Sheet 02700, Paving Details. (Future)*

AGENCY CONTACT - Mr. Matthew Evans, FASLA - (202) 224-6645

G202 - PARKING LOTS

DESIGN REQUIREMENTS

General: Provide parking as specified in the building program. Provide gradients across parking lots between 1:100 minimum and 1:20 maximum. * Provisions designated by an asterisk correspond with GSA standards.

Surface Parking Lots: Provide parking stalls conforming to the following:

- **Standard size parking stalls:** 10 ft x 18 ft. (3 000 mm x 5 400 mm*), 90 degree orientation, [unless otherwise directed by the AOC](#).
- **Accessible stalls:** Provide 5 ft side aisle between two adjoining spaces.
- **Two-Way Access Aisles:** 24 ft. (7 200 mm*).

Paving: Pave parking lots with asphaltic concrete.

Walkways: 5 ft. (1500 mm*) wide to allow 2 persons to pass. Hold walkways adjoining parking stalls a minimum of 30" (750 mm*) away from the curb. Provide positive walkway cross-slope of 1:50 to ensure water runoff and to limit ice accumulation.

Gratings: Do not locate gratings, inlets, etc. in walkways.

Lighting: Provide lighting [conforming with](#) the luminance levels specified below. Control exterior lighting with photo-cells and astronomical time clocks. Where possible, locate lighting standards at perimeters of lots, oriented for minimum illumination of adjoining properties.

- **Standard parking:** 1 footcandle minimum, uniform across all parking areas.
- **Secure parking:** 1 footcandle minimum, uniform across all parking areas.

RESTRICTIONS

- N.A.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 02755, Parking Lot Paving. (Future)*
- *AOC Standard Details - Sheet 02700, Asphaltic Paving Details. (Future)*

AGENCY CONTACT - Mr. Matthew Evans, FASLA - (202) 224-6645

G203 - PEDESTRIAN PAVING

DESIGN REQUIREMENTS

Standard Concrete Walks: Provide 5 ft. (1200 mm) wide sidewalks, 4" nominal thickness, 3,500 PSI, 6% air-entrained concrete, broom finish over a 6-mil polyethylene vapor barrier. Provide positive cross-slopes of 1:50 to prevent ponding of water and accumulation of ice.

- ***Walks Subject to vehicular Traffic:*** 6" nominal thickness, 4,000 PSI, 6% air entrained concrete, broom finish, over 6-mil polyethylene vapor barrier.

Exposed Aggregate Concrete Walks: Use only where directed by the AOC. Exposed aggregate concrete sidewalks require higher maintenance/replacement than standard broom finished concrete. Comply with AOC Guide Specifications.

Expansion Joints: Provide cork expansion joints at maximum spacings of 30 ft. (9 000 mm), with greased rods penetrating the joints to prevent vertical displacement. Seal tops of all expansion joints with urethane sealants.

Concrete Pavers: Use only when approved by the AOC.

Joint Sealants: Urethane compounds for all horizontal joints in exterior pedestrian paving.

Granite Curbs: Provide where required to match existing District of Columbia installations. Specifications for granite curbs are included in AOC Guide Specifications.

RESTRICTIONS

- Do not locate site utilities under permanent paving.

RELATED DOCUMENTS

- AOC Guide Specification - Section 02513, Exposed Aggregate Concrete Sidewalk Replacement.
- *AOC Guide Specification - Section 02780, Unit Pavers. (Future)*
- *AOC Standard Details - Sheet AOC02525, Standard Curbs. (Future)*

AGENCY CONTACT - Mr. Matthew Evans, [FASLA](#) - (202) 224-6645.

G204 - SITE DEVELOPMENT

DESIGN REQUIREMENTS

- **General:** This section deals with fountains, fences standards, site furnishings, exterior signs, flagpoles, etc.
- **Ornamental Metal Fences:** Designs for all ornamental fences shall be approved by Congressional Leadership, based upon the recommendation of the AOC Landscape Architect.
- **Chain Link Fences:** Chain link fences shall be coated with black or dark green color vinyl with matching rails, fasteners, and hardware.
- **Construction Fences:** In prominent locations, provide wood fences with wood moldings (AOC Standard Construction fence) and paint in off-white or “putty” color as approved by the AOC Landscape Architect. In less prominent locations provide wood fences without wood moldings (AOC Utility Construction Fence) and painted as above. For construction fences located off of the Capitol Complex, provide standard galvanized steel chain link fences.

RESTRICTIONS

- Do not use chain-link construction fences within the Capitol Complex without written AOC approval.

RELATED DOCUMENTS

- AOC Standard Construction Fence Drawing - AOC01500.DGN (MicroStation format only).

AGENCY CONTACT - Mr. Matthew Evans, FASLA - (202) 224-6645

G205 - LANDSCAPING

DESIGN REQUIREMENTS

- **General:** All landscape designs shall be approved by the AOC Landscape Architect.
- **Irrigation Systems:** Conform with available flow rate gallons per minute (GPM) and corresponding water pressure as verified by either project specific testing or certified tests conducted within the preceding five years. All designs shall include back-flow preventers, clean-outs, moisture sensors, and automated controls.
- **Lawns and Grasses:** Conform with State of Maryland or State of Virginia turf grass standards. Provide either a fescue blend or Kentucky Bluegrass blend as approved by the Landscape Architect
- **Trees, Plants, and Ground Covers:** Conform with standards of the American Association of Nurserymen (AAN) and the Washington Area Landscape Contractors Association (WALCA). Plants shall be appropriate to USDA temperature Hardiness Zone #7.

RESTRICTIONS

- Not applicable.

RELATED DOCUMENTS

- MasterSpec Guide Specification - 02900, Landscaping.

AGENCY CONTACT - Mr. Matthew Evans, FASLA - (202) 224-6645

G500 - SITE ELECTRICAL UTILITIES

DESIGN REQUIREMENTS

Utility Company Coordination: Contact and coordinate the work with the following organizations when performing work within the Capitol Complex:

- **PEPCO** - Electrical service and related requirements.
- **District of Columbia** - Department of Public Works -
 - Traffic Signal Division
 - Streetlight Division
- **Off-Site:** Contact the AOC when designing facilities off of the main Capitol Complex and obtain direction regarding utility service prior to contacting any utility providers.

Utility Availability: Data must be established prior to initial system design. Electrical load estimates must be prepared in conjunction with utility company discussions to establish the capacity of the new electrical services. Coordinate locations for transformers, vaults, meters and other utility items with the architectural design.

RESTRICTIONS

- Do not start design prior to verifying utility information.

RELATED DOCUMENTS

- Succeeding sections.

AGENCY CONTACT - Electrical Engineering Division - (202) 226-3471

G-501 - SITE ELECTRICAL DISTRIBUTION

DESIGN REQUIREMENTS

Systems: Exterior distribution systems must be either direct buried conduit or concrete encased conduit systems. Base cable selection on all aspects of cable operation and the installation environment, including corrosion, ambient heat, rodent attack, pulling tensions and potential mechanical abuse. GSA

Concrete Encased Ductbank: Use concrete encased ductbanks where many utility conduits follow the same route, for runs under permanent hard pavements and where service reliability is paramount, such as feeders. Keep electrical and communications ducts clear of all other existing or new underground utilities, including steam or chilled water lines. GSA The following are appropriate for concrete encased distribution ductbanks:

- Schedule 40 PVC, coated intermediate metallic conduit (IMC), or
- Rigid galvanized steel (RGS).
- [Dict Sizes: Provide a sufficient number of spare ducts to allow for future expansion but in no case less than 25% of planned current need.](#)

Manholes: Manholes should be provided with a minimum of two spare stubs and steel ladder.

RESTRICTIONS

- **Direct Buried Conduit:** Do not use direct buried cables of any type.

RELATED DOCUMENTS

- *AOC Standard Details - AOC-G501.DGN - Site Electrical Distribution (Future)*

AGENCY CONTACT - AOC, Electrical Engineering Division - (202) 226-3470.

G5020.3 - SITE LIGHTING SYSTEMS

DESIGN REQUIREMENTS

Lighting Standard: Lighting standards for exterior lighting shall conform to AOC Standard Details used on within the Capitol Complex. Lighting standards shall be cast iron or fluted metal shaft with cast iron base.

HID Lamps: Lamps shall be HID, metal halide, 3000-3200 degrees Kelvin.

Levels: Lighting levels for exterior spaces should be values indicated by the IES Lighting Handbook.

Controls: Control exterior lighting circuits by an astronomical time clock and photocell.

Conduits in Concrete Foundations:

- *For streetlights:* A minimum of two - 1-1/2" PVC conduits, one for power and one for security, shall enter and exit each concrete foundation.
- *For parking lot and grounds lighting:* A minimum of two - 1" PVC conduits, one for power and one for security, shall enter and exit each concrete foundation.

Conduit Routing: Conduits from concrete foundations should run from a hand hole adjacent to the foundation to the nearest Capitol Complex building.

RESTRICTIONS

- Do not use fiberglass or lightweight metal poles or pole accessories.

RELATED DOCUMENTS

- *AOC Guide Specification - Section 03300, Cast-In-Place Concrete.*
- *AOC Guide Specification - Section 16521, Exterior Lighting.*
- *AOC Standard Details - AOC-G502.DGN - Site Lighting Systems. (Future)*

AGENCY CONTACT - Electrical Engineering Division - (202) 226-3470

SECTION 013591 - SPECIAL PROCEDURES FOR HISTORIC TREATMENT**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. **Drawings and general provisions** of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

This Section includes special procedures for historic treatment on Project including, but not limited to, the following:

1. Storage and protection of existing historic materials.
2. Temporary protection of historic materials during construction.
3. Protection during application of chemicals.
4. Historic treatment procedures.
5. Removal of bird excrement.

1.3 DEFINITIONS

- A. **"Preservation"**: To apply measures necessary to sustain the existing form, integrity, and materials of a historic property. Work may include preliminary measures to protect and stabilize the property.
- B. **"Rehabilitation"**: To make possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features that convey its historical, cultural, or architectural values.
- C. **"Restoration"**: To accurately depict the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and the reconstruction of missing features from the restoration period.
- D. **"Reconstruction"**: To reproduce in the exact form and detail a building, structure, or artifact as it appeared at a specific period in time.
- E. **"Stabilize"**: To apply measures designed to reestablish a weather-resistant enclosure and the structural reinforcement of an item or portion of the building while maintaining the essential form as it exists at present.
- F. **"Protect and Maintain"**: To remove deteriorating corrosion, reapply protective coatings, and install protective measures such as temporary guards; to provide the least degree of intervention.

- G. **"Repair"**: To stabilize, consolidate, or conserve; to retain existing materials and features while employing as little new material as possible. Repair includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials. Within restoration, repair also includes limited replacement in kind, rehabilitation, and reconstruction, with compatible substitute materials for deteriorated or missing parts of features when there are surviving prototypes.
- H. **"Replace"**: To duplicate and replace entire features with new material in kind. Replacement includes the following conditions:
1. Duplication: Includes replacing elements damaged beyond repair or missing. Original material is indicated as the pattern for creating new duplicated elements.
 2. Replacement with New Materials: Includes replacement with new material when original material is not available as patterns for creating new duplicated elements.
 3. Replacement with Substitute Materials: Includes replacement with compatible substitute materials. Substitute materials are not allowed, unless otherwise indicated.
- I. **"Remove"**: To detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- J. **"Remove and Salvage"**: To detach items from existing construction and deliver them to AOC.
- K. **"Remove and Reinstall"**: To detach items from existing construction, repair and clean them for reuse, and reinstall them where indicated.
- L. **"Existing to Remain" or "Retain"**: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed and salvaged, or removed and reinstalled.
- M. **"Material in Kind"**: Material that matches existing materials, as much as possible, in species, cut, color, grain, and finish.

1.4 SUBMITTALS

- A. **Historic Treatment Program**: Submit a written plan for each phase or process including protection of surrounding materials during operations. Describe in detail materials, methods, and equipment to be used for each phase of work.
- B. **Alternative Methods and Materials**: If alternative methods and materials to those indicated are proposed for any phase of work, provide a written description including evidence of successful use on other, comparable projects, and program of testing to demonstrate effectiveness for use on this Project.
- C. **Qualification Data**: For historic treatment specialists and supervisory personnel. Include list of completed projects with the scope of work and budget for each.

- D. **Photographs or Videotape:** As directed by the Task Order, show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by historic treatment operations. Submit before work begins.
- E. **Record Documents:** Include modifications to manufacturer's written instructions and procedures, as documented in the historic treatment preconstruction conference and as the Work progresses.

1.5 QUALITY ASSURANCE

- A. **Historic Treatment Specialist Qualifications:** A firm that employs personnel, including supervisory personnel, experienced and skilled in the processes and operations indicated.
- B. **Historic Treatment Preconstruction Conference:** Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."
 - 1. Review manufacturer's written instructions for precautions and effects of products and procedures on building materials, components, and vegetation.
 - a. Record procedures established as a result of the review and distribute to affected parties.

1.6 STORAGE AND PROTECTION OF HISTORIC MATERIALS

- A. **Removed and Salvaged Historic Materials:**
 - 1. Clean salvaged historic items.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until delivery to AOC.
 - 4. Transport items to Government's storage area designated by AOC.
 - 5. Protect items from damage during transport and storage.
 - 6. Do not dispose of items removed from existing construction without prior written consent of AOC.
- B. **Removed and Reinstalled Historic Materials:**
 - 1. Clean and repair historic items to functional condition adequate for intended reuse.
 - 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 - 3. Protect items from damage during transport and storage.
 - 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- C. **Existing Historic Materials to Remain:** Protect construction indicated to remain against damage and soiling during historic treatment. When permitted by Architect, items may be removed to a suitable, protected storage location during historic treatment, and cleaned when

directed by the Task Order, and reinstalled in their original locations after historic treatment operations are complete.

- D. **Storage and Protection:** When removed from their existing location, store historic materials within a weather-tight enclosure where they are protected from wetting by rain, snow, or ground water, and temperature variations. Secure stored materials to protect from theft.

1. Identify removed items with an inconspicuous mark indicating their original location.

1.7 PROJECT-SITE CONDITIONS

A. Exterior Cleaning and Repairing:

1. **Proceed** with the work only when forecasted weather conditions are favorable.
 - a. **Wet Weather:** Do not attempt repairs during rainy or foggy weather. Do not apply primer, paint, putty, or epoxy when the relative humidity is above 80 percent. Do not remove exterior elements of structures when rain is forecast or in progress.
 - b. Do not perform exterior wet work when the air temperature is below 40 deg F (5 deg C).
 - c. Do not begin cleaning, patching, or repairing when there is any likelihood of frost or freezing.
 - d. Do not begin cleaning when either the air or the surface temperature is below 45 deg F (7 deg C) unless approved means are provided for maintaining a 45 deg F (7 deg C) temperature of the air and materials during, and for 48 hours subsequent to, cleaning.
2. **Perform cleaning** and rinsing of the exterior only during daylight hours.

- B. **Government personnel** will occupy portions of building immediately adjacent to historic treatment area. Conduct historic treatment so Government operations will not be disrupted. Provide not less than 72 hours' notice to AOC of activities that will affect Government operations.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 PROTECTION, GENERAL

- A. **Comply** with manufacturer's written instructions for precautions and effects of products and procedures on adjacent building materials, components, and vegetation.

- B. **Ensure** that supervisory personnel are present when work begins and during its progress.
- C. **Temporary Protection of Historic Materials during Construction:**
 - 1. Protect existing materials during installation of temporary protections and construction. Do not deface or remove existing materials.
 - 2. Attachments of temporary protection to existing construction shall be approved by Architect prior to installation.
- D. **Protect landscape work** adjacent to or within work areas as follows:
 - 1. Provide barriers to protect tree trunks.
 - 2. Bind spreading shrubs.
 - 3. Use coverings that allow plants to breathe and remove coverings at the end of each day. Do not cover plant material with a waterproof membrane for more than 8 hours at a time.
 - 4. Set scaffolding and ladder legs away from plants.
- E. **Existing Drains:** Prior to the start of work or any cleaning operations, test drains and other water removal systems to ensure that drains and systems are functioning properly. Notify AOC immediately of drains or systems that are stopped or blocked. Do not begin Work of this Section until the drains are in working order.
 - 1. Provide a method to prevent solids including stone or mortar residue from entering the drains or drain lines. Clean out drains and drain lines that become blocked or filled by sand or any other solids because of work performed under this Contract.
 - 2. Protect storm drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.

3.2 PROTECTION DURING APPLICATION OF CHEMICALS

- A. **Protect persons**, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm or damage resulting from applications of chemical cleaners and paint removers.
- B. **Comply** with requirements in Division 1 Section "Temporary Facilities and Controls."
- C. **Cover adjacent surfaces** with materials that are proven to resist chemical cleaners selected for Project unless chemicals being used will not damage adjacent surfaces. Use covering materials that contain only waterproof, UV-resistant adhesives. Apply masking agents to comply with manufacturer's written instructions. Do not apply liquid masking agent to painted or porous surfaces. When no longer needed, promptly remove masking to prevent adhesive staining.
- D. **Do not clean surfaces** during winds of sufficient force to spread cleaning solutions to unprotected surfaces.

- E. **Neutralize and collect** alkaline and acid wastes and dispose of off Government property.
- F. **Dispose of runoff** from chemical operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.

3.3 HISTORIC TREATMENT PROCEDURES

- A. **The principal aim of preservation work** is to halt the process of deterioration and stabilize the item's condition, unless otherwise indicated. Repair is required where specifically indicated. The following procedures shall be followed:
 - 1. **Retain** as much existing material as possible; repair and consolidate rather than replace.
 - 2. **Use additional material** or structure to reinforce, strengthen, prop, tie, and support existing material or structure.
 - 3. **Use** reversible processes wherever possible.
 - 4. **Use traditional replacement materials and techniques.** New work shall be distinguishable to the trained eye, on close inspection, from old work.
 - 5. **Record the work** before the procedure with preconstruction photos and during the work with periodic construction photos. Photographic documentation is specified in Division 1 Section "Photographic Documentation."
- B. **Prohibit smoking** by personnel performing work on or near historic structures.
- C. **Obtain AOC's review and written approval** in the form of a Constructive Change Directive or Supplemental Instruction before making changes or additions to construction or removing historic materials.
- D. **Notify AOC** of visible changes in the integrity of material or components whether due to environmental causes including biological attack, UV degradation, freezing, or thawing; or due to structural defects including cracks, movement, or distortion.
 - 1. Do not proceed with the work in question until directed by Architect.
- E. **Where missing features** are indicated to be repaired or replaced, provide features whose designs are based on accurate duplications rather than on conjectural designs, subject to the approval of Architect and Preservation Specialist.
- F. **Where Work** requires existing features to be removed, cleaned, and reused, perform these operations without damage to the material itself, to adjacent materials, or to the substrate.
- G. **Identify new or replacement materials** and features with inconspicuous, permanent marks to distinguish them from original materials. Record the legend of identification marks and the locations of these marks on Record Drawings.
- H. **When cleaning**, match samples of existing materials that have been cleaned and identified for

acceptable cleaning levels. Avoid overcleaning to prevent damage to existing materials during cleaning.

3.4 REMOVAL OF BIRD EXCREMENT

- A. **General:** Before disturbing accumulated bird excrement, consult with an occupational medicine physician, industrial hygienist, and authorities having jurisdiction to determine acceptable removal procedures and appropriate protective measures for personnel.
- B. **Removing Bird Excrement:** Treat bird excrement before its removal as required by authorities having jurisdiction.
 - 1. Prior to removal, dampen excrement to prevent it from becoming airborne.
 - 2. Use only nonmetallic tools (plastic spatulas and brushes with natural fiber or nylon bristles, or their equivalent) to remove excrement.
 - 3. Collect removed excrement and legally disposed of off site.
 - 4. Perform bird excrement removal work from the outside of the building with windows and other openings in the building closed.

END OF SECTION 013591